

=> FILE REG
FILE 'REGISTRY' ENTERED ON 28 AUG 2007
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=> DISPLAY HISTORY FULL L1-

FILE 'REGISTRY'
E CERIUM OXIDE/CN
L1 2 SEA "CERIUM OXIDE"/CN
L2 91 SEA (CE (L) O)/ELS (L) 2/ELC.SUB
L3 92 SEA L1 OR L2

FILE 'HCA'
L4 2546 SEA L3/P
L5 1222 SEA RAMP?(2A)(TEMP# OR TEMPERATUR?)
L6 17734 SEA (SLOW? OR STEADY? OR STEADIL?)(2A)(HEAT? OR WARM? OR
THERMAL? OR THERMO?)
L7 473404 SEA (RISE# OR RISING# OR RAIS? OR ELEVAT? OR INCREAS? OR
HIGHER? OR HEIGHTEN?)(2A)(TEMP# OR TEMPERATUR?)
L8 1 SEA .DEG.C(W)(HOUR# OR HR# OR H)

FILE 'HCAPLUS'
L9 17196 SEA OTA ?/AU
L10 5410 SEA TANIMOTO ?/AU
L11 13 SEA TAKAKUMA ?/AU
L12 5 SEA L9 AND L10 AND L11
L13 318837 SEA (.DEG. OR .DEGREE.)(2W)(HOUR# OR HR# OR H)
L14 8393 SEA L3 (L) (PRODUC? OR PROD# OR GENERAT? OR MANUF? OR
MFR# OR CREAT? OR FORM## OR FORMING# OR FORMAT? OR MAKE#
OR MADE# OR MAKING# OR FABRICAT? OR SYNTHESI? OR PREPAR?
OR PREP#)
L15 4374 SEA (CEO OR CEO2 OR (CERIUM# OR CE)(W)(OXIDE# OR
DIOXIDE#))(2A)(PRODUC? OR PROD# OR GENERAT? OR MANUF? OR
MFR# OR CREAT? OR FORM## OR FORMING# OR FORMAT? OR MAKE#
OR MADE# OR MAKING# OR FABRICAT? OR SYNTHESI? OR PREPAR?
OR PREP#)
L16 5 SEA (L4 OR L14 OR L15) AND L5
L17 15 SEA (L4 OR L14 OR L15) AND L6
L18 449 SEA (L4 OR L14 OR L15) AND L7
L19 0 SEA (L4 OR L14 OR L15) AND L8
L20 410 SEA (L4 OR L14 OR L15) AND L13
L21 31 SEA L18 AND L20
L22 30919 SEA L3

L23 425 SEA L22 AND L18
L24 379 SEA L22 AND L20
L25 28 SEA L23 AND L24
L26 193935 SEA (TEMP# OR TEMPERATUR?) (2A) RANG?
L27 757964 SEA (400 OR 425 OR 450 OR 475 OR 500 OR 525 OR 550 OR
575 OR 600 OR 625 OR 650 OR 675 OR 700 OR 725 OR 750 OR
775 OR 800 OR 825 OR 850 OR 875 OR 900 OR 925 OR 950 OR
975 OR 1000 OR 1025 OR 1050 OR 1075 OR 1100 OR 1125 OR
1150 OR 1175 OR 1200) (2A) (.DEG. OR .DEGREE. OR DEGREE#)
L28 188 SEA (L4 OR L14 OR L15) AND L26
L29 2143 SEA (L4 OR L14 OR L15) AND L27
L30 89 SEA L28 AND L29
L31 25 SEA L18 AND L28
L32 186 SEA L18 AND L29
L33 7 SEA L20 AND L28
L34 266 SEA L20 AND L29
L35 23 SEA L32 AND L34
L36 14 SEA L30 AND L32
L37 6 SEA L30 AND L34
L38 11 SEA L16 OR L37
L39 27 SEA (L17 OR L36) NOT L38
L40 39 SEA (L25 OR L31 OR L35) NOT (L38 OR L39)
L41 0 SEA L21 NOT (L38 OR L39 OR L40)
L42 8 SEA 1840-2002/PY,PRY AND L38
L43 14 SEA 1840-2002/PY,PRY AND L39
L44 23 SEA 1840-2002/PY,PRY AND L40
L45 32 SEA (L38 OR L39 OR L40) NOT (L42 OR L43 OR L44)

=> FILE HCA
FILE 'HCA' ENTERED ON 28 AUG 2007
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=> D L42 1-8 BIB ABS HITSTR HITIND

L42 ANSWER 1 OF 8 HCA COPYRIGHT 2007 ACS on STN
AN 140:367126 HCA Full-text
TI Manufacture of cerium oxide particle
for polishing silica substrate
IN Ota, Isao; Tanimoto, Kenji; Takakuma, Noriyuki
PA Nissan Chemical Industries, Ltd., Japan
SO PCT Int. Appl., 38 pp.

CODEN: PIXXD2
DT Patent
LA Japanese
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	WO 2004037722	A1	20040506	WO 2003-JP13754	200310 28
				<--	
	W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, KE, KG, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW				
	RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG				
JP	2004168638	A	20040617	JP 2003-357661	200310 17
				<--	
JP	2004168639	A	20040617	JP 2003-357664	200310 17
				<--	
AU	2003275697	A1	20040513	AU 2003-275697	200310 28
				<--	
CN	1708458	A	20051214	CN 2003-80102269	200310 28
				<--	
US	2006150526	A1	20060713	US 2005-532316	200504 22
				<--	
PRAI	JP 2002-312860	A	20021028	<--	
	JP 2002-312869	A	20021028	<--	
	WO 2003-JP13754	W	20031028		

- AB The invention relates to a process for making cerium oxide particles by heating a cerium compd. to raise the temp. of the compd. from ordinary temp. to a temp. range of 400° to 1200°, which comprises at least either the temp.-rise step of heating at a rate of temp. rise of 2° to 60°/h or the temp.-rise step of heating while feeding a moistened gas. According to the process, cerium oxide powder having a narrow diam. distribution of primary particles can be obtained. Further, when an aq. cerium oxide slurry made by using the powder is used as an abrasive, high-quality polished surfaces can be attained without lowering the rate of polishing, which brings about an enhancement in the productivity of the polishing step and a lowering in the cost. The aq. cerium oxide slurry is useful particularly as an abrasive for the fine polishing of substrates contg. silica as the main component.
- IT 11129-18-3, Cerium oxide
(manuf. of cerium oxide particle
for polishing silica substrate)
- RN 11129-18-3 HCA
- CN Cerium oxide (CA INDEX NAME)
- *** STRUCTURE DIAGRAM IS NOT AVAILABLE ***
- IC ICM C01F017-00
ICS C09K003-14; B24B037-00; H01L021-304
- CC 76-3 (Electric Phenomena)
- IT Polishing materials
(abrasive pastes; manuf. of cerium
oxide particle for polishing silica substrate)
- IT Polishing
(chem.-mech.; manuf. of cerium oxide
particle for polishing silica substrate)
- IT Firing (heat treating)
(manuf. of cerium oxide particle
for polishing silica substrate)
- IT Abrasives
(polishing pastes; manuf. of cerium
oxide particle for polishing silica substrate)
- IT 11129-18-3, Cerium oxide
(manuf. of cerium oxide particle
for polishing silica substrate)
- IT 7631-86-9, Silica, processes
(manuf. of cerium oxide particle
for polishing silica substrate)
- L42 ANSWER 2 OF 8 HCA COPYRIGHT 2007 ACS on STN
AN 134:140534 HCA Full-text
- TI Methods of making a superconductor multilayer with few
temperature ramps
- IN Zhang, Wei; Rupich, Martin W.; Li, Qi

PA American Superconductor Corporation, USA
SO PCT Int. Appl., 52 pp.

CODEN: PIXXD2

DT Patent

LA English

FAN.CNT 10

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	WO 2001008231	A2	20010201	WO 2000-US19290	200007 14
				<--	
	WO 2001008231	A3	20010830		
	W:	AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CR, CU, CZ, DE, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, UZ, VN, YU, ZA, ZW			
	RW:	GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG			
	US 6562761	B1	20030513	US 2000-500717	200002 09
	AU 200113250	A	20010213	AU 2001-13250	200007 14
				<--	
	WO 2001011428	A1	20010215	WO 2000-US19215	200007 14
				<--	
	WO 2001011428	A8	20011011		
	WO 2001011428	A9	20020725		
	W:	AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CR, CU, CZ, DE, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, UZ, VN, YU, ZA, ZW			
	RW:	GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG			
	AU 200117509	A	20010305	AU 2001-17509	

				200007 14
US 6669774	B1	20031230	US 2000-615991	<-- 200007 14
US 6828507	B1	20041207	US 2000-617518	<-- 200007 14
US 6893732	B1	20050517	US 2000-616810	<-- 200007 14
US 2002144838	A1	20021010	US 2002-154566	<-- 200205 24
<--				
PRAI	US 6765151	B2	20040720	
	US 1999-145468P	P	19990723	<--
	US 1999-166140P	P	19991118	<--
	US 1999-166145P	P	19991118	<--
	US 1999-166297P	P	19991118	<--
	US 2000-500701	A	20000209	<--
	US 2000-500717	A	20000209	<--
	US 2000-500718	A	20000209	<--
	US 2000-616810	A	20000714	<--
	US 2000-617518	A3	20000714	<--
	WO 2000-US19215	W	20000714	<--
	WO 2000-US19290	W	20000714	<--
AB	The invention relates to methods of making a superconductor. The compns. can be used in methods using relatively few temp. ramps, varying pressures of H2O vapor, and/or isothermal treatment steps. The methods and compns. can be used to form superconductor material intermediates that have relatively few cracks and/or blisters.			
IT	1306-38-3, Cerium dioxide, processes (buffer; in making superconductor multilayer with few temp. ramps)			
RN	1306-38-3 HCA			
CN	Cerium oxide (CeO2) (CA INDEX NAME)			

O == Ce == O

IC ICM H01L039-00
CC 76-4 (Electric Phenomena)
IT Heat treatment
 (in making superconductor multilayer with few temp.
 ramps)
IT Electronic device fabrication
 Multilayers
 Superconducting films
 Superconductor devices
 (making superconductor multilayer with few temp.
 ramps)
IT Cuprates, processes
 (making superconductor multilayer with few temp.
 ramps)
IT Water vapor
 (making superconductor multilayer with few temp.
 ramps using)
IT Fluorides, processes
 (oxyfluorides; in making superconductor multilayer with few
 temp. ramps)
IT Coating process
 (spin; in making superconductor multilayer with few temp
 . ramps)
IT 1314-36-9, Yttrium oxide (Y2O3), processes
 (YSZ buffer; making superconductor multilayer with few
 temp. ramps)
IT 1306-38-3, Cerium dioxide, processes 1314-23-4, Zirconium
oxide (ZrO₂), processes 64417-98-7, Yttrium zirconium oxide
 (buffer; in making superconductor multilayer with few
 temp. ramps)
IT 7782-44-7, Oxygen, processes 16712-25-7, Copper
bis(trifluoroacetate) 37737-28-3, Yttrium trifluoroacetate
60884-92-6, Barium trifluoroacetate
 (in making superconductor multilayer with few temp.
 ramps)
IT 107539-20-8P, Barium copper yttrium oxide 121339-20-6P, Barium
calcium copper strontium oxide
 (making superconductor multilayer with few temp.
 ramps)
IT 109064-29-1DP, Barium copper yttrium oxide (Ba₂Cu₃YO₇),
oxygen-deficient
 (making superconductor multilayer with few temp.
 ramps)
L42 ANSWER 3 OF 8 HCA COPYRIGHT 2007 ACS on STN
AN 131:221390 HCA Full-text
TI Crystallization of yttria- and ceria-stabilized zirconia obtained

from homogeneous precipitation with urea
AU de Oliveira, Ana Paula Almeida; de Barros, Sandra Decourt; Torem,
Mauricio Leonardo
CS Engenharia Metalurgica, Brazil
SO Congresso Anual - Associacao Brasileira de Metalurgia e Materiais (1998), Volume Date 1997, 52nd(II Congresso Internacional de Tecnologia Metalurgica e de Materiais), 2722-2742
CODEN: CAAMEU
PB Associacao Brasileira de Metalurgia e Materiais
DT Journal; (computer optical disk)
LA Portuguese
AB Pure ZrO₂, ZrO₂-Y₂O₃ and ZrO₂-CeO₂ were produced by homogeneous pptn. with urea from Zr oxychloride, Y chloride and Ce chloride. The effect of these stabilizers, as well as process variables such as temp., time and urea concn., on the crystn. of these powders was studied and discussed adopting differential scanning calorimeter (DSC) and XRD. The temp. of the reactions that occur along the heating of powders previously dried at 50. degree. for 12 h were detd. by DSC using ultrapure argon at a heating rate of 10°/min-1 from room temp. to 650°. Cryst. phases were detd. by XRD. Pure zirconia presented crystn. reaction at 480° resulting in a partially stabilized tetragonal zirconia. In the presence of yttria, this reaction occurred between 480° and 520°. However, in the presence of ceria the range of crystn. temp. was between 530°-640°. Cooling step showed that these reaction were irreversible.
CC 75-1 (Crystallography and Liquid Crystals)
RE.CNT 14 THERE ARE 14 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L42 ANSWER 4 OF 8 HCA COPYRIGHT 2007 ACS on STN
AN 129:220321 HCA Full-text
TI Physicochemical and catalytic properties of CeO₂-ZrO₂ solid solutions supported and dispersed on γ-Al₂O₃
AU Nunan, John G.
CS ASEC Manufacturing, USA
SO Society of Automotive Engineers, [Special Publication] SP (1997), SP-1288(Zirconium in Emission Control), 77-86
CODEN: SAESA2; ISSN: 0099-5908
PB Society of Automotive Engineers
DT Journal
LA English
AB Three-way conversion (TWC) catalyst supports were prep'd. having CeO₂-ZrO₂ solid soln. particles uniformly dispersed on γ-Al₂O₃ as discrete crystallites. Support morphol. was characterized using scanning transmission electron microscopy (STEM) and transmission electron microscopy (TEM) anal. Temp. programmed redn. (TPR) and x-ray diffraction (XRD) analyses were also conducted on precious metal

(PM)-contg. and PM-free samples before and after aging. Results were combined with performance measurements to demonstrate the beneficial effect of solid soln. formation on TWC catalyst activity. STEM and TEM anal. showed that well-dispersed CeO₂-ZrO₂ solid soln. particles could be formed and simultaneously supported on a high surface area γ-Al₂O₃ support. For samples calcined at 600° , crystallite sizes ≤ 50 Å were formed vs. sizes > 200 Å in aged samples. TPR results suggested that for supports calcined at 600° , most CeO₂ present was reduced from the Ce⁴⁺ to the Ce³⁺ state at 250-700. degree.. H₂ uptake in this temp. range was assigned to redn. of Ce⁴⁺ ions at the surface or sub-surface of CeO₂ crystallites. Addn. of Pt and Rh to the supports resulted in a synergistic redn. of PM and CeO₂; most of the CeO₂ was reduced, esp. solid soln. contg. samples. After aging, it was further shown that CeO₂-ZrO₂ solid soln. formation clearly promoted CeO₂ redn. at temps. typically assocd. with surface CeO₂ redn. Thus, CeO₂-ZrO₂ supported and dispersed solid solns. showed the same enhancements in redox activity as obsd. earlier for non-supported materials. XRD anal. confirmed that solid soln. formation occurred for Zr-contg. samples, giving a qual. measure of the CeO₂ crystallite size. Performance measurements were made on Zr-free and Zr-contg. air aged samples washcoated onto monolith substrates. For these catalysts, performance advantages were obsd. for Zr-contg. samples after lab. aging at 1000. degree. for 24 h in air. Aged sample characterization using a combination of XRD and TEM further confirmed that morphol. consisted of evenly dispersed CeO₂-ZrO₂ solid soln. crystallites on the Al₂O₃ surface. Similar CeO₂ crystallite size trends were obsd. in XRD and TEM analyses; doping with Zr stabilized the CeO₂ with respect to sintering.

CC 59-3 (Air Pollution and Industrial Hygiene)

Section cross-reference(s): 51, 67

RE.CNT 27 THERE ARE 27 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L42 ANSWER 5 OF 8 HCA COPYRIGHT 2007 ACS on STN

AN 129:139904 HCA Full-text

TI NO + CO → 1/2 N₂ + CO₂ differentiated from 2NO + CO → N₂O + CO₂ over rhodia/ceria catalysts using ¹⁵N¹⁸O and ¹³C¹⁶O reactants or time-resolution of products

AU Cunningham, Joseph; Hickey, Neal J.; Farrell, Frank; Bowker, M.; Weeks, Colin

CS Chemistry Department, University College Cork, Ire.

SO Studies in Surface Science and Catalysis (1998), 116(Catalysis and Automotive Pollution Control IV), 409-418
CODEN: SSCTDM; ISSN: 0167-2991

PB Elsevier Science B.V.

DT Journal

LA English
AB Profiles vs. ramp-temp. for isotope exchange between $^{15}\text{N}^{18}\text{O}$ and 0.5% RhO_x/CeO₂, CeO₂, or Rh2O₃ materials within a re-circulatory reactor system indicated unique low-temp. lability of 16O-surface species at Rh2O₃-CeO₂ perimeter positions upon pre-oxidized 0.5% RhO_x/CeO₂ and its absence there from after LTR. Likewise, onset temps. and relative efficiencies were compared for conversion of $^{15}\text{N}^{18}\text{O}$ plus 13C16O mixts. to isotopically distinguishable forms of N₂O, N₂, and CO₂ products over pre-oxidized and pre-reduced materials. Complementary insights into the time-sequence for appearance of N₂O and N₂ products in the gas phase over the materials at selected temps. at 125-298° are provided by results conducted in an alternative micro-reactor system which allowed introduction of individual 10s pulses of CO into a continuous flow of NO plus He over pre-oxidized or pre-reduced aliquots of materials.
IT 1306-38-3, Ceria, uses
(rhodia and; activity and selectivity of pre-oxidized and pre-reduced rhodia/ceria three way catalysts to differentiate NO + CO → 1/2 N₂ + CO₂ from 2NO + CO → N₂O + CO₂ using 15N18O and 13C16O reactants or time-resoln. of products)
RN 1306-38-3 HCA
CN Cerium oxide (CeO₂) (CA INDEX NAME)



CC 59-3 (Air Pollution and Industrial Hygiene)
Section cross-reference(s): 51, 67
IT 1306-38-3, Ceria, uses
(rhodia and; activity and selectivity of pre-oxidized and pre-reduced rhodia/ceria three way catalysts to differentiate NO + CO → 1/2 N₂ + CO₂ from 2NO + CO → N₂O + CO₂ using 15N18O and 13C16O reactants or time-resoln. of products)
RE.CNT 15 THERE ARE 15 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L42 ANSWER 6 OF 8 HCA COPYRIGHT 2007 ACS on STN
AN 128:211589 HCA Full-text
TI Growth and analysis of CeO₂ thin films on Si(111) substrate prepared by electron-beam evaporation
AU Kim, Chong Geol; Kim, Kwan Pyo; Lee, Ju Bong; Han, Ki Pyung; Park, Chong Yun; Jang, Hyun Duck
CS Department of Physics, Sung Kyun Kwan University, Suwon, 440-746, S.

Korea
SO Journal of the Korean Physical Society (1998), 32(1),
64-70
CODEN: JKPSDV; ISSN: 0374-4884
PB Korean Physical Society
DT Journal
LA English
AB The microstructure of a CeO₂ layer grown on a (111) silicon substrate by using high-vacuum evapn. was studied for the cleaning and deposition conditions. The microstructure in the CeO₂ layer is an amorphous, nano-cryst., or columnar structure, depending on the growth conditions. The epitaxial CeO₂ layer on Si(111) has good crystal quality for hydrogen termination on the silicon surface(H-Si), two-step deposition, and substrate heating at 400°. This epitaxial layer has a columnar structure with high crystal quality. It is desirable to keep the H-termination on the silicon surface in order to prevent silicon surface oxidn. during the initial growth step. However, the capacitance-voltage and the current-voltage curves of the film are noisy curve and show a low oxide breakdown voltage owing to many dangling bonds on the columnar grain boundaries. The CeO₂ layer grown on Si(111) has a slightly larger and denser columnar structure for a ramping up substrate temp. at 400°. This epitaxial CeO₂ layer shows the growth of mainly a (111) crystallog. orientation in x-ray diffraction pattern and has a stable C-V response and, from the I-V curve, a low dielec. strength. If some intermediate SiO₂ is in the as-deposited film, the C-V curves have a hysteresis (ΔV) due to trapped charges near the interfaces (CeO₂/SiO₂ and SiO₂/Si). In order that the CeO₂ layer have good elec. characteristics, it is desirable to increase the packing d. of the CeO₂ layer during deposition, to anneal the film in an ambient (O₂ or N₂), and to make the intermediate SiO₂ by oxidn. In the at. force microscopic images, the films show smooth surfaces and increasing grain size with increasing substrate temp. Since the evaporator has a low-energy system (0.1-0.2 eV) for evapg. species (CeO₂, Ce₂O₃), the grain size of CeO₂ layer is small. To increase the grain size laterally, the energy needs to be supplied externally by the ion source in the evaporator.
IT 1306-38-3, Cerium dioxide, properties
 (growth and anal. of CeO₂ thin films on Si(111) substrate
 prep'd. by electron-beam evapn.)
RN 1306-38-3 HCA
CN Cerium oxide (CeO₂) (CA INDEX NAME)



CC 76-3 (Electric Phenomena)
Section cross-reference(s): 67, 72, 73
IT 1306-38-3, Cerium dioxide, properties
(growth and anal. of CeO₂ thin films on Si(111) substrate
prep'd. by electron-beam evapn.)
RE.CNT 22 THERE ARE 22 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L42 ANSWER 7 OF 8 HCA COPYRIGHT 2007 ACS on STN
AN 123:60565 HCA Full-text
TI Manufacture of composite catalysts for synthesis gas manufacture by
oxidative conversion of methane or natural gas
IN Choudhary, Vasant R.; Rane, Vilas H.; Rajput, Amarjeet M. R.
PA Council of Scientific and Industrial Research, India
SO U.S., 12 pp.
CODEN: USXXAM
DT Patent
LA English
FAN.CNT 2

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	US 5411927	A	19950502	US 1992-930007	199208 14
	US 5368835	A	19941129	US 1993-33106	199303 16

PRAI EP 1992-306906 19920729 <--
US 1992-930007 A3 19920814 <--

AB The process for manufg. synthesis gas comprises passing continuously
a gaseous mixt. comprising CH₄ (or natural gas) and O (or air) with
or without water vapor over reduced or unreduced composite catalyst
contg. oxides having general formula Tm.Nn.R.O_p (T is ≥1 of Ni, CO,
and Ir, and the like; m = T/R mol. ratio; N = transition or
nontransition element selected from ≥1 of Ti, Zr, Hf, Zn, Mg, Ca, and
the like; n = N/R mol. ratio; R = rare earth element selected from ≥1
of La, Ce, Pr, Ho, Yb, and the like; p = no. of O atoms required to
satisfy the valence requirement of the elements in the composite
catalyst). The synthesis gas is produced in high yields and at very
high prodn. rates by oxidative conversion of CH₄ or natural gas to CO
and H or synthesis gas, using the composite catalyst contg.
nontransition and/or transition metal oxides. Thus, 7.0 g powd.
Yb₂O₃, 10.34 g powd. Ni(NO₃)₂.6H₂O and 1.0 mL deionized water were

mixed, and the resulting thick paste was dried in air at 120° for 6 h. The dried mass was decompd. in air at 605° for 4 h. The decompd. mass was then powd., pressed without binder at 4 ton pressure and crushed to particle size 20-30 mesh. The catalyst particles were then calcined in air at 900.degree . for 4 h to give a NiO.Yb2O3 catalyst having surface area 6.30 m²/g. The catalyst was used for the oxidative conversion of CH₄ to CO and H, i.e., synthesis gas, at temps. ranging from 602 to 702, 803, 496, and 298°. The effluent gas was cooled to about 0° to condense the water formed in the reaction and then analyzed for CO, CO₂, H, and unconverted CH₄ and O. The conversion of CH₄ was 80.6, 84.9, 89.3, 74.0, and 71.1%, and the selectivity for CO was 92.6, 95.2, 97.4, 89.8, and 84.4%, resp.

IT 11129-18-3, Cerium oxide
(composite oxide catalyst manuf. for synthesis
gas manuf. by oxidative conversion of methane and
natural gas)

RN 11129-18-3 HCA

CN Cerium oxide (CA INDEX NAME)

*** STRUCTURE DIAGRAM IS NOT AVAILABLE ***

IC ICM B01J037-14
 ICS B01J023-78; B01J023-10; B01J023-58

INCL 502302000

CC 49-1 (Industrial Inorganic Chemicals)

IT 1305-78-8, Calcia, uses 1307-96-6, Cobalt oxide, uses 1308-87-8,
Dysprosium oxide 1308-96-9, Europium oxide 1309-48-4, Magnesia,
uses 1312-81-8, Lanthanum oxide 1313-97-9, Neodymium oxide
1313-99-1, Nickel oxide, uses 1314-37-0, Ytterbium oxide
11113-84-1, Ruthenium oxide 11129-18-3, Cerium oxide
12032-20-1, Lutetium oxide 12036-25-8, Promethium oxide
12036-32-7, Praseodymium oxide 12036-41-8, Terbium oxide
12036-44-1, Thulium oxide 12055-62-8, Holmium oxide 12060-58-1,
Samarium oxide 12061-16-4, Erbium oxide 12064-62-9, Gadolinium
oxide 12624-27-0, Rhenium oxide

(composite oxide catalyst manuf. for synthesis
gas manuf. by oxidative conversion of methane and
natural gas)

L42 ANSWER 8 OF 8 HCA COPYRIGHT 2007 ACS on STN

AN 117:218553 HCA Full-text

TI Rare earth oxide-based ceramics, and their manufacture

IN Chane-Ching, Jean Yves; Orange, Gilles

PA Rhone-Poulenc Chimie SA, Fr.

SO Fr. Demande, 16 pp.

CODEN: FRXXBL

DT Patent

LA French

FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI FR 2667590	A1	19920410	FR 1990-12279	199010 05

<--

PRAI FR 1990-12279

19901005 <--

AB The ceramics contain ≥ 98 mol.% rare earth oxides, and have av. crystallite size $0.4\text{--}3 \mu\text{m}$, d. $\geq 94\%$ of the theor. d. of the corresponding rare earth oxide. The ceramics are manufd. by sintering compns. contg. ≥ 98 mol.% (as oxide) rare earth compd. having av. particle size $<1 \mu\text{m}$. As a result of their very small crystallite size, these ceramics have improved mech. properties. A powd. mixt. consisting of Gd2O3 powder (av. particle size $0.7 \mu\text{m}$) contg. 0.5 mol.% Nb2O5 (av. particle size $0.5 \mu\text{m}$) was molded, and the greenware sintered in oxidizing atm. at 1500°C for 2 h (temp. ramp. in heating and cooling $400^\circ/\text{h}$) to give ceramics having d. 7.87 (95.6% of theor.), vs. 7.23 g/cm^3 (88.2% of theor.) for Gd2O3 ceramics.

IT 11129-18-3P, Cerium oxide
(ceramics, manuf. of, sintering aids for, for d. and strength)

RN 11129-18-3 HCA

CN Cerium oxide (CA INDEX NAME)

*** STRUCTURE DIAGRAM IS NOT AVAILABLE ***

IC ICM C04B035-50

CC 57-2 (Ceramics)

IT 1308-87-8P, Dysprosium oxide (Dy2O3) 1308-96-9P, Europium oxide 1314-37-0P, Ytterbium oxide 11129-18-3P, Cerium oxide 12060-58-1P, Samarium oxide (Sm2O3) 12061-16-4P, Erbium oxide 12064-62-9P, Gadolinium oxide (Gd2O3) 12738-76-0P, Terbium oxide 39455-61-3P, Holmium oxide 39455-67-9P, Lutetium oxide 39455-81-7P, Thulium oxide
(ceramics, manuf. of, sintering aids for, for d. and strength)

=> D L43 1-14 BIB ABS HITSTR HITIND

L43 ANSWER 1 OF 14 HCA COPYRIGHT 2007 ACS on STN

AN 138:179004 HCA Full-text

TI Method of producing thermistor element, and production apparatus for producing raw materials for thermistor element

IN Kuzuoka, Kaoru; Ogata, Itsuhei; Makino, Daisuke; Yorinaga, Muneo

PA Denso Corp., Japan

SO U.S. Pat. Appl. Publ., 38 pp.

CODEN: USXXCO

DT Patent
 LA English
 FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	US 2003038704	A1	20030227	US 2002-227805	200208 27
				<--	
	US 6824713	B2	20041130		200108
	JP 2003068507	A	20030307	JP 2001-256150	27
				<--	
	JP 2003119080	A	20030423	JP 2001-311723	200110 09
				<--	
	DE 10239058	A1	20030403	DE 2002-10239058	200208 26
				<--	
	FR 2830669	A1	20030411	FR 2002-10644	200208 27

PRAI JP 2001-256150 A 20010827 <--
 JP 2001-311723 A 20011009 <--

AB This invention relates to a method of producing a thermistor element, formed mainly of a metal oxide sintered body, and a prodn. app. for producing raw materials for such a thermistor element. The thermistor element can be appropriately used for a thermistor element of a temp. sensor, for an automobile exhaust gas, etc., capable of detecting a temp. from room temp. to a high temp. in the range of .gtoreq.1000.degree .. When producing a ceramic element formed of a sintered metal oxide as a principal, this invention aims to make uniform the compn. of a ceramic raw material and to reduce the variance of the resistance of the ceramic element. A prodn. method of the invention comprises the following steps: prep. a precursor soln. by mixing a precursor of a metal oxide in a liq. phase, spraying the precursor soln. and obtaining droplet particles, heat-treating the droplet particles and obtaining thermistor raw material powder, and molding and sintering the thermistor raw material powder into a predetd. shape and obtaining a metal oxide sintered body. The method of producing a sintered ceramic element obtained by sintering a metal oxide ceramic raw material includes the following steps: mixing a precursor of a metal oxide in a liq. phase and prep. a

precursor soln.; spraying the precursor soln. and obtaining droplet particles; heat-treating the droplet particles and obtaining raw material powder of a ceramic element; heat-treating the raw material powder obtained in the 1st heat-treatment step at a temp. higher than the 1st heat-treatment step, which changes the mean particle size of the raw material powder to 0.1-1.0 μm ; and granulating, molding, and sintering the raw material powder obtained in the 2nd heat-treatment step.

- IT 1306-38-3, Cerium oxide (CeO₂), reactions
(method of producing thermistor element, and
prodn. app. for producing raw materials for
thermistor element)
- RN 1306-38-3 HCA
- CN Cerium oxide (CeO₂) (CA INDEX NAME)



- IC ICM H01C007-10
- INCL 338022000R
- CC 76-2 (Electric Phenomena)
Section cross-reference(s): 57
- IT 1303-86-2, Boron oxide (B₂O₃), reactions 1305-78-8, Calcium oxide (CaO), reactions 1306-38-3, Cerium oxide (CeO₂), reactions 1308-38-9, Chromium oxide (Cr₂O₃), reactions 1308-87-8, Dysprosium oxide (Dy₂O₃) 1309-37-1, Ferric oxide, reactions 1309-48-4, Magnesium oxide (MgO), reactions 1313-96-8, Niobium oxide (Nb₂O₅) 1313-97-9, Neodymium oxide (Nd₂O₃) 1313-99-1, Nickel oxide (NiO), reactions 1314-13-2, Zinc oxide (ZnO), reactions 1314-23-4, Zirconium oxide (ZrO₂), reactions 1314-37-0, Ytterbium oxide (Yb₂O₃) 1314-61-0, Tantalum oxide (Ta₂O₅) 1317-34-6, Manganese oxide (Mn₂O₃) 1317-61-9, Iron oxide (Fe₃O₄), reactions 1344-28-1, Alumina, reactions 1344-43-0, Manganous oxide, reactions 7631-86-9, Silica, reactions 7789-02-8, Chromium nitrate nonahydrate 10034-94-3, Magnesium silicate (Mg₂SiO₄) 10101-39-0 12003-86-0, Aluminum yttrium oxide (Al₂YO₃) 12005-21-9, Aluminum yttrium oxide (Al₅Y₃O₁₂) 12024-21-4, Gallium oxide (Ga₂O₃) 12027-88-2, Yttrium silicate (Y₂SiO₅) 12032-20-1, Lutetium oxide (Lu₂O₃) 12036-32-7, Praseodymium oxide (Pr₂O₃) 12036-41-8, Terbium oxide (Tb₂O₃) 12036-44-1, Thulium oxide (Tm₂O₃) 12053-26-8, Magnesium chromate (MgCr₂O₄) 12055-23-1, Hafnium oxide (HfO₂) 12055-62-8, Holmium oxide (Ho₂O₃) 12060-08-1, Scandium oxide (Sc₂O₃) 12060-58-1, Samarium oxide (Sm₂O₃) 12061-16-4, Erbium oxide (Er₂O₃) 12064-62-9, Gadolinium oxide (Gd₂O₃) 12068-51-8, Aluminum magnesium oxide (Al₂MgO₄)

13463-67-7, Titanium dioxide, reactions 13477-34-4, Calcium nitrate tetrahydrate 13494-98-9, Yttrium nitrate hexahydrate 13776-74-4, Magnesium metasilicate ($MgSiO_3$) 17141-63-8, Nitric acid, manganese(2+) salt, hexahydrate 18282-10-5, Tin oxide (SnO_2) 62462-47-9, Europium oxide (Eu_2O)

(method of producing thermistor element, and
prodn. app. for producing raw materials for
thermistor element)

RE.CNT 12 THERE ARE 12 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L43 ANSWER 2 OF 14 HCA COPYRIGHT 2007 ACS on STN

AN 133:304821 HCA Full-text

TI Valence Characteristics and Structural Stabilities of the Electrolyte Solid Solutions $Ce_1-xRE_xO_2-\delta$ (RE = Eu, Tb) by High Temperature and High Pressure

AU Li, Liping; Li, Guangshe; Che, Yulu; Su, Wenhui

CS Department of Physics and Key Laboratory of Inorganic Synthesis and Preparative Chemistry, Jilin University, Changchun, 130023, Peop. Rep. China

SO Chemistry of Materials (2000), 12(9), 2567-2574
CODEN: CMATEX; ISSN: 0897-4756

PB American Chemical Society

DT Journal

LA English

AB Solid solns. $Ce_1-xRE_xO_2-\delta$ (RE = Eu, Tb) were prep'd. by a high-temp. and -pressure method. The products were characterized by XRD, TG, EPR, XPS, and Mossbauer spectroscopy. XRD data anal. showed that all solid solns. crystd. in a single-phase cubic fluorite structure. The nonlinear relations between the lattice parameter and dopant content for both series of solns. were ascribed to the results of cation substitutions and variations of the relative content of O vacancy V_O and defect assocns. {RE'CeVO} and {Ce'CeVO}. EPR and XPS measurements confirmed the presence of Ce^{3+} ions in the solid solns. For the solid solns. $Ce_1-xEuxO_2-\delta$, all Eu ions are trivalent by XPS and ^{151}Eu Mossbauer measurements. For the solns. $Ce_1-xTbxO_2-\delta$, all Tb ions were also stabilized in the trivalent state. This result is different from that of the counterpart by hydrothermal conditions, in which a mixed valence of Tb^{3+}/Tb^{4+} prevails at a higher dopant content. The prep'd. solns. $Ce_1-xTbxO_2-\delta$ were metastable. With increasing temp., they would be destabilized and decomp. into two fluorite phases, accompanied by partial oxidn. from Tb^{3+} to Tb^{4+} . A.c. impedance spectroscopy showed primarily bulk conduction for all samples. For the solns. $Ce_1-xEuxO_2-\delta$, the temp. dependence of the ionic cond. was linear within the temp. range measured with activation energies of 1.05, 0.82, and 0.87 for $x = 0.2, 0.38$, and 0.5, resp. For the

decompn. product of the solid soln. Ce_{0.71}Tb_{0.29}O_{2-δ}, the cond. gave two linear regions with smaller activation energies; i.e., the activation energy was 0.60 eV <600° and 0.39 eV >600°. The higher ionic cond. (1.1 + 10⁻² S/cm at 720°) for the decompn. phases of the soln. Ce_{0.71}Tb_{0.29}O_{2-δ} was ascribed to an electronic component involved in relation to the presence of the mixed valence of Tb³⁺/Tb⁴⁺ and Ce³⁺/Ce⁴⁺.

IT 1306-38-3, Cerium dioxide, reactions
(reactant for prepn. of cerium europium/terbium oxides)
RN 1306-38-3 HCA
CN Cerium oxide (CeO₂) (CA INDEX NAME)



CC 78-2 (Inorganic Chemicals and Reactions)
Section cross-reference(s): 75, 76
ST cerium lanthanide oxide prepn structure elec cond; valence cerium
lanthanide oxide; terbium cerium oxide
prepн structure elec cond; europium cerium
oxide prepн structure elec cond
IT 1306-38-3, Cerium dioxide, reactions 1308-96-9, Europium
sesquioxide 12037-01-3, Terbium oxide (Tb407)
(reactant for prepn. of cerium europium/terbium oxides)
RE.CNT 20 THERE ARE 20 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L43 ANSWER 3 OF 14 HCA COPYRIGHT 2007 ACS on STN
AN 133:77541 HCA Full-text
TI Microstructural evolution of an Al₉₂Mn₆Ce₂ alloy during mechanical
alloying, hot extrusion and heat-treatments
AU Ji, Y.; Kallio, M.; Tiainen, T.
CS Institute of Materials Science, Tampere University of Technology,
Tampere, FIN-33101, Finland
SO Scripta Materialia (2000), 42(11), 1017-1023
CODEN: SCMAF7; ISSN: 1359-6462
PB Elsevier Science Inc.
DT Journal
LA English
AB The formation of a supersatd. Al-based solid soln. phase in the mech.
alloyed (MA) and compacted structures and two new metastable phases
in the compacted and subsequently annealed structures are reported.
MA of the mixt. of elemental Al, Mn and Ce powders corresponding to
the compn. Al₉₂Mn₆Ce₂ led to the formation of a nanocryst. supersatd.
solid soln. of fcc Al. Undissolved Ce tended to oxidize and form

CeO₂. The as-extruded microstructure contg. the supersatd. fcc Al phase and CeO₂ phase was stable below the temp. of 500°. On the elevated temp. exposure of the as-extruded MA powder closely below the temp. of 500°, the equil. Al6Mn phase was formed through the decompn. of the supersatd. solid soln. (fcc Al) phase. The annealing at 500 -550° led to the formation of metastable phases in the as-extruded MA powder. CeO₂ particles remained stable in the studied annealing temp. range from 430-630°. They were located on the boundaries of the intermetallic Al6Mn phase, which suppressed the growth of the intermetallic Al6Mn phase.

IT 1306-38-3, Cerium dioxide,
formation (nonpreparative)
(formation of; microstructural evolution of an
Al92Mn6Ce2 alloy during mech. alloying, hot extrusion, and heat
treatments)
RN 1306-38-3 HCA
CN Cerium oxide (CeO₂) (CA INDEX NAME)



CC 56-8 (Nonferrous Metals and Alloys)
IT 1306-38-3, Cerium dioxide,
formation (nonpreparative) 12043-69-5
(formation of; microstructural evolution of an
Al92Mn6Ce2 alloy during mech. alloying, hot extrusion, and heat
treatments)
RE.CNT 9 THERE ARE 9 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L43 ANSWER 4 OF 14 HCA COPYRIGHT 2007 ACS on STN
AN 130:342122 HCA Full-text
TI Single-Phase Pr_{Oy}-ZrO₂ Materials and Their Oxygen Storage Capacity:
A Comparison with Single-Phase CeO₂-ZrO₂, Pr_{Oy}-CeO₂, and
Pr_{Oy}-CeO₂-ZrO₂ Materials
AU Narula, C. K.; Haack, L. P.; Chun, W.; Jen, H.-W.; Graham, G. W.
CS Chemistry Department, Ford Motor Company, Dearborn, MI, 48121, USA
SO Journal of Physical Chemistry B (1999), 103(18), 3634-3639
CODEN: JPCBFK; ISSN: 1089-5647
PB American Chemical Society
DT Journal
LA English
AB High-surface-area Pr_{Oy}-ZrO₂ mixed oxide, crystd. in the cubic
fluorite structure, is synthesized for the first time as a single-
phase material over a wide range of compn. by sol-gel processing. X-

ray powder diffraction shows that the material remains single-phase even after thermal treatment in air to 900°. The oxygen storage capacity of PrOy-ZrO₂, where praseodymium undergoes Pr³⁺ ↔ Pr⁴⁺ interconversion, is assessed by temp.-programmed redn. with H₂. The results show that there is little oxygen storage capacity unless the PrOy concn. exceeds 25 mol %. A comparison of oxygen storage capacity from similarly prepd. single-phase CeO₂-ZrO₂, PrOy-CeO₂, and PrOy-CeO₂-ZrO₂ materials is presented. Measurements of lattice parameter and reducibility suggest that there are preferred assocons. that lead to PrOy-ZrO₂ and CeO₂-ZrO₂ rather than PrOy-CeO₂ in the ternary mixed oxide. An evaluation of model Pd catalysts, using PrOy-ZrO₂ and CeO₂-ZrO₂ as support materials, in functional tests approximating warmed-up, steady -state operation of an automotive catalyst, is also reported.

CC 59-3 (Air Pollution and Industrial Hygiene)

Section cross-reference(s): 51, 67

RE.CNT 19 THERE ARE 19 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L43 ANSWER 5 OF 14 HCA COPYRIGHT 2007 ACS on STN

AN 124:186445 HCA Full-text

TI Formation of the Ce/Y2O₃ interface: an in situ XPS study

AU Thromat, N.; Gautier-Soyer, M.; Bordier, G.

CS CEA-Direction des Sciences de la Matiere, Departement de Recherche sur l'Etat Condense, les Atomes et les Molecules, Service de Recherche sur les Surfaces et l'Irradiation de la Matiere, CE-Saclay, 91191, Gif sur Yvette, Fr.

SO Surface Science (1996), 345(3), 290-302

CODEN: SUCSAS; ISSN: 0039-6028

PB North-Holland Physics

DT Journal

LA English

AB We have studied the formation of the Ce/Y2O₃ interface by XPS from a Ce vapor deposited onto a polycryst. stoichiometric Y2O₃ sample. The substrate temp. ranged between the room temp. and 850°C, which is above the cerium m.p. (795°C). The shape of the Ce3d photoelectron lines shows that even at room temp., an interfacial compd. Ce2O_{3-x} forms over a few at. layers. When the substrate temp. increases, the thickness of this oxidized layer increases. A model based on a diffusion mechanism of oxygen atoms coming from the oxide substrate is proposed to account for the exptl. results.

IT 1345-13-7E, Cerium oxide (Ce2O₃), oxygen-deficient
(formation as interface between Ce deposited and Y2O₃
substrate)

RN 1345-13-7 HCA

CN Cerium oxide (Ce2O₃) (CA INDEX NAME)

*** STRUCTURE DIAGRAM IS NOT AVAILABLE ***

- CC 66-5 (Surface Chemistry and Colloids)
Section cross-reference(s): 67, 73
- IT Interface
(cerium oxide interface formation
on Ce deposition on polycryst. Y203)
- IT 1345-13-7D, Cerium oxide (Ce2O3), oxygen-deficient
(formation as interface between Ce deposited and Y203
substrate)
- L43 ANSWER 6 OF 14 HCA COPYRIGHT 2007 ACS on STN
AN 120:118093 HCA Full-text
- TI Thermodynamics and phase equilibrium of Cu-Ce-O, Cu-Ce-O-S liquid
solutions
- AU Du, Ting; Li, Guodong
- CS Cent. Iron Steel Res. Inst., Minist. Metall. Ind., Beijing, Peop.
Rep. China
- SO Jinshu Xuebao (1993), 29(7), B316-B322
CODEN: CHSPA4; ISSN: 0412-1961
- DT Journal
- LA Chinese
- AB Thermo. of Cu-Ce-O, Cu-Ce-S and Cu-Ce-O-S solns. at 1200°C were
studied by using solid electrolyte cell and chem. equil. method. The
equil. consts. of deoxidn., desulfurization and deoxysulfurization by
Ce, the Gibbs std. free energies of the formation of Ce2O3, CeS,
Ce2O2S in Cu-base soln., activity interaction coeffs. of S and Ce,
temp. dependence of std. free energy of soln. of Ce in Cu and the
self-interaction coeffs. of Ce in liq. Cu have been obtained. The
phase pptn. diagram for Cu-Ce-S-O system has been plotted. The
steady thermo. condition of the existence of Ce2O3, CeS and Ce2O2S
in liq. Cu has been detd.
- IT 1345-13-7, Cerium oxide (Ce2O3)
(free energy of formation of)
- RN 1345-13-7 HCA
- CN Cerium oxide (Ce2O3) (CA INDEX NAME)
- *** STRUCTURE DIAGRAM IS NOT AVAILABLE ***
- CC 69-1 (Thermodynamics, Thermochemistry, and Thermal Properties)
- IT Free energy
(of formation, of cerium oxide
sulfide)
- IT 1345-13-7, Cerium oxide (Ce2O3) 12014-82-3, Cerium sulfide
(CeS) 12442-45-4, Cerium oxide sulfide (Ce2O2S)
(free energy of formation of)
- L43 ANSWER 7 OF 14 HCA COPYRIGHT 2007 ACS on STN
AN 110:157156 HCA Full-text
- TI Method of preparing ammonia and ammonia synthesis catalysts
- IN Cirjak, Larry M.; Schmidt, Richard P., Jr.

PA Standard Oil Co., USA

SO U.S., 7 pp.

CODEN: USXXAM

DT Patent

LA English

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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PI	US 4789538	A	19881206	US 1987-74736	19870717 17

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PRAI US 1987-74736

19870717 <--

AB The title catalysts are prepd. from precursors consisting of lanthanide-promoted Group VII metal cyanide salts of formula AyMa[M'(CN)c]b.nH₂O (y = 0-4; a = 0.1-4; c = 4-6; b = 0.1-4; n = 0-30; A = alkali or alk. earth metal; M = La, Ce, etc., M' = Group VII metal). The precursors, which are free of Al and U, are slowly heated under a nonoxidizing atm. to 275-450° for activation, and N and H are passed over the resulting catalysts at high temp. and pressure to give NH₃. Thus, KCe[Fe(CN)₆] was prepd. and impregnated onto colloidal CeO₂ to give a supported catalyst. After activation, a 2:1 mixt. of H and N was passed over the catalyst at 455° and pressure 1500 psi; NH₃ was formed at 14.55 vol.%, vs. 1.44-4.55 vol.% for Group VII cyanide catalysts which did not include alkali metal promoters.

IT 1306-38-3, Ceria, uses and miscellaneous

(support, for ammonia synthesis catalysts from lanthanide-promoted transition metal cyanide salts)

RN 1306-38-3 HCA

CN Cerium oxide (CeO₂) (CA INDEX NAME)

O==Ce==O

IC ICM C01C001-04

INCL 423362000

CC 49-8 (Industrial Inorganic Chemicals)

IT 1306-38-3, Ceria, uses and miscellaneous

(support, for ammonia synthesis catalysts from lanthanide-promoted transition metal cyanide salts)

L43 ANSWER 8 OF 14 HCA COPYRIGHT 2007 ACS on STN

AN 103:166830 HCA Full-text

TI Surface chemistry of cerium oxide
prepared by an isobaric thermal procedure
AU Fierro, J. L. G.; Mendioroz, S.; Olivan, A. M.
CS Inst. Catal. Petroleoquim., CSIC, Madrid, 28006, Spain
SO Journal of Colloid and Interface Science (1985), 107(1),
60-9
CODEN: JCISA5; ISSN: 0021-9797
DT Journal
LA English
AB Catalytically active forms of CeO₂ were prepd. by slow thermal decomprn. of amorphous Ce(OH)₄ at a const. rate and low H₂O vapor pressure (12 N/m²). Structural and phase changes accompanying thermal decomprn. were followed by thermogravimetric anal., x-ray diffraction, and SEM. Although the precursors are amorphous, they became cryst. at >570 K. Anal. of N₂ adsorption-desorption isotherms at 77 K showed that their surface areas are high (50-60 m²/g) at low temp. but decrease drastically as the sintering temp. increases. The presence of both CO₃²⁻ and H-linked structures and their evolution with increasing temp. under vacuum was investigated by IR spectroscopy.
IT 1306-38-3P, uses and miscellaneous
(catalysts, prepn. and structure of)
RN 1306-38-3 HCA
CN Cerium oxide (CeO₂) (CA INDEX NAME)



CC 67-1 (Catalysis, Reaction Kinetics, and Inorganic Reaction
Mechanisms)
Section cross-reference(s): 78
IT 1306-38-3P, uses and miscellaneous
(catalysts, prepn. and structure of)
L43 ANSWER 9 OF 14 HCA COPYRIGHT 2007 ACS on STN
AN 93:214560 HCA Full-text
TI Thermal study of the formation of condensed ceric oxide-ammonium
dihydrogen phosphates
AU Vaivada, M.; Konstants, Z.
CS Inst. Neorg. Khim., Riga, USSR
SO Term. Anal., Tezisy Dokl. Vses. Soveshch., 7th (1979),
Volume 1, 123-4. Editor(s): Karlivan, V. P. Publisher: zinatne,
Riga, USSR.
CODEN: 44GVA5
DT Conference

LA Russian
AB The reaction products in the CeO₂-NH₄H₂PO₄ system at 20-600° were studied by DTA, x-ray phase anal., and IR spectra. At a P:Ce ratio >10 cryst. Ce ultraphosphate is formed at 550° during rapid heating whereas at P:Ce ratios <10 Ce(PO₃)₃ and CeP₂O₇ are formed at 300-400° during rapid heating. During slow heating and at a P:Ce ratio >10, Ce(NH₄)₂(PO₃)₅ is formed; at P:Ce >4, Ce(NH₄)P₄O₁₂ is formed at 300-400°. At >450° Ce(NH₄)₂(PO₃)₅ decompd. to Ce(NH₄)P₄O₁₂ which decompd. to CeP₅O₁₄ at 550°. At 350-400° from mixts. contg. 20-30% CeO₂, Ce(NH₄)P₄O₁₂ and Ce(PO₃)₄ were obtained, the latter of which was reduced at 450° to Ce(PO₃)₃.
CC 78-6 (Inorganic Chemicals and Reactions)

L43 ANSWER 10 OF 14 HCA COPYRIGHT 2007 ACS on STN
AN 73:123199 HCA Full-text
TI Densification and electrical conductivity of hot-pressed ZrO₂-CeO₂ mixtures
AU Kose, Saburo; Kinoshita, Makoto; Hamano, Yoshiteru
CS Govt. Ind. Res. Inst., Osaka, Japan
SO Yogyo Kyokaishi (1970), 78(901), 307-18
CODEN: YGKSA4; ISSN: 0009-0255
DT Journal
LA Japanese
AB Hot-pressing of ZrO₂-CeO₂ powder mixts. was carried out at temps. ranging from 1400° to 1700° in graphite molds. Pressure of 210 kg/cm² was applied throughout the hot-pressing process. Shrinkage of the compact during hot-pressing was measured by a dilatometric method. Bulk d. of the hot-pressed body was measured and the d. change of the compact during hot-pressing was calcd. Densification data for ZrO₂ compacts without additives were processed with Murray's equation based on plastic flow mechanism. Plots of log (1 - p) vs. t were divided into 3 parts, that is, initial stage characterized by very rapid densification, intermediate stage in which fairly good linearities were obtained, and final stage characterized by very slow densification. The densification data were also processed with Fryer's equation based on stress enhanced diffusion mechanism. Densification of ZrO₂ was strongly accelerated by addn. of up to 20 mole % CeO₂. The max. relative d. was attained at ZrO₂ contg. 5 mole % CeO₂. X-ray powder diffraction anal. showed that a pyrochlore-type Ce₂Zr₂O₇ was formed by hot-pressing of ZrO₂CeO₂ mixts. in reducing atm., and it was changed easily into tetragonal ZrO₂ solid soln. by oxidizing at 1500° in air. The elec. cond. of the oxidized specimen was measured in air with Kelvin's double bridge in the temperature range from 500° to 1500°. The cond. at elevated temps. was strongly dependent on the temp. From the elec. cond. data transformation temps. from monoclinic from to tetragonal form were lowered by increasing the CeO₂ content. The max. in cond.

isotherms was attained when ZrO₂ contained 80 mole % of CeO. The cond. in this compn. was $5.50 + 10^{-5}$ ohm⁻¹ cm⁻¹ at 600°, $3.55 + 10^{-2}$ at 1000°, and 1.15 at 1500°.

CC 57 (Ceramics)

IT 12157-80-1P

(formation of, from cerium oxide
and zirconium oxide in hot-pressing)

L43 ANSWER 11 OF 14 HCA COPYRIGHT 2007 ACS on STN

AN 71:26861 HCA Full-text

TI Uranium dioxide

PA Associated Electrical Industries Ltd.

SO Fr., 3 pp.

CODEN: FRXXAK

DT Patent

LA French

FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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PI FR 1538877 19680906 FR 1967-121904

196709
22

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GB 1172226 GB

19660929 <--

PRAI AB Structural modification of UO₂ is prevented by adding 0.8-2% CeO₂ thereby reducing escape of dissolved Xe. Thus, uranium oxide powder having the compn. UO₂-0.4 is mixed with CeO₂ powder into a mortar, poly(Bu methacrylate) is added as a binding agent, and the mixt. is compressed into a matrix under 40 kg./mm.². The binding agent is eliminated by slowly heating (400°/hr.) the mixt. to 1750° and keeping it at this temp. during 2 hrs. The product contained about 1% by wt. CeO₂ and had a d. of 10.51 g./cc. with a grain size of about 20 μ. By heating to 1800°, the fraction of degassed xenon was 4.3 + 10⁻³. Under the same conditions, but without the addn. of CeO₂, the fraction of degassed xenon was 13 + 10⁻³.

IT 1306-38-3

(nuclear reactor fuels of uranium oxide contg., for improved fission product retention)

RN 1306-38-3 HCA

CN Cerium oxide (CeO₂) (CA INDEX NAME)



IC C01G; G21C
CC 76 (Nuclear Technology)
IT Nuclear reactor fuels, preparation
 (of uranium oxide contg. cerium oxide for
 fission products retention)
IT 1306-38-3
 (nuclear reactor fuels of uranium oxide contg., for improved
 fission product retention)

L43 ANSWER 12 OF 14 HCA COPYRIGHT 2007 ACS on STN
AN 65:28146 HCA Full-text
OREF 65:5186f-h,5187a
TI Crucibles of cerium dioxide
AU Ivanov, E. G.; Filippov, A. F.; Min'kov, D. B.; Makarova, T. S.;
Vinogradova, L. V.
CS Inst. Steel and Alloys, Moscow
SO Ogneupory (1966), 31(5), 27-9
CODEN: OGNPA2; ISSN: 0369-7290
DT Journal
LA Russian
AB For press molding of ceria crucibles, the CeO₂ powder was ground to 5-15 μ grain size and mixed at 70-90° with 8% org. binder consisting of 95% paraffin and 5% oleic acid. The mass was poured into a steel press mold and compressed under 150-200 kg./cm.² The green pieces were slowly preheated to 1200° and sintered at 1500-1600° in an elec. resistance furnace. For slip casting of small (15-28 ml.) lab.-crucibles, the CeO₂ material was wet ground in a steel mill, washed in a concd. HCl soln., and cast in plaster of Paris molds. The crucibles were fired in saggers on MgO grains up to 1750°, with 6-9 hrs. soaking time. Sp. gr. of the fired body was 6.4-6.6 g./cm.³, apparent porosity 1%. The press-molded crucibles had a thicker wall and a higher porosity than the slip-cast pieces. The crucibles were used for melting of Ce-Ni and La-Ni alloys contg. up to 12.5% Ce and up to 7.2% La, resp. Max. melting temp. was 1550° held for 30 min. -3 hrs., depending on conditions of the expts. For heat shock protection, the CeO₂ crucibles were placed inside of Al₂O₃ crucibles. At a slow uniform heating, the CeO₂ crucibles did not crack, and were usable for 3 melting operations. Small addn. of MgO, CaO, or SrO make ceria ceramics more stable under the heat-shock conditions. Ce reduces CeO₂ forming Ce₂O₃. This reaction was not apparent with Ce-Ni alloys, probably because of the formation of a thin layer of Ce₂O₃ at the inner wall of the crucible. A confirmation of that was found in an approx. 10% lesser content of Ce in the fused alloy as compared with the initial batch compns. In Al₂O₃ crucibles, the Ce content of fused alloys was less than 1/2 of the initial batch concn. Exptl.

La₂O₃ crucibles (thermo- dynamically nonreducible by Ce) were found to be of a very good chem. stability against Ce alloys. X-ray analysis of Ce-Ni alloys, fused in CeO₂ crucibles, did not reveal the presence of Ce₂O₃. The O content in 0.38 % Ce-Ni alloy, fused in a CeO₂ crucible, was 0.001%, identical with that of pure fused Ni itself.

CC 21 (Ceramics)

L43 ANSWER 13 OF 14 HCA COPYRIGHT 2007 ACS on STN

AN 63:69050 HCA Full-text

OREF 63:12664g-h,12665a

TI Thermal decomposition of hydrated chlorides of rare earth elements

AU Haeseler, Guenther; Matthes, Franz

CS Tech. Hochsch. Chem. "Carl Schorlemmer,", Leuna-Merseburg, Germany

SO Journal of the Less-Common Metals (1965), 9(2), 133-51

CODEN: JCOMAH; ISSN: 0022-5088

DT Journal

LA German

AB Oxides with a purity of 98.5 to 99.8% were used as starting materials. Thermal dehydration of hydrated rare earth chlorides were studied with an automatic thermobalance at various conditions. By using very low heating rates, accurate results of hydrate decompn. and the formation of oxide compds. were obtained. Thermal decompn. of the hydrated chlorides of La, Pr, and Nd in air gave various hydrates and anhyd. chlorides. The products of the thermal decompn. up to 500° were the oxychlorides; Ce under these conditions formed CeO₂. With Sm to Lu, the prepn. of the anhyd. chlorides in an air stream was impossible even with extremely slow heating. The decompn. of the monohydrates always gave oxide compds. During the decompn. in a mixt. of air and HCl the following hydrates were found: MCl_{3-x}H₂O (M is rare earth metal) and x = 6, 3.5, 3, 2.5, 2, and 1. The hydrates which were formed by the particular elements varied. In the formation of the oxychlorides from the monohydrates (Sm to Lu) in an air stream the stages were probably M(OH)Cl₂, MOCl·H₂O, and MOCl·MCl₃·2H₂O. The compd. MOCl·H₂O [or M(OH)₂Cl] is prep'd. by hydration in the gas phase and the thermal decompn. of the hydrated product. The formation of the anhyd. trihalides from the oxychlorides or oxides in an HCl stream was studied for some of these elements

CC 14 (Inorganic Chemicals and Reactions)

L43 ANSWER 14 OF 14 HCA COPYRIGHT 2007 ACS on STN

AN 63:68936 HCA Full-text

OREF 63:12643h,12644a

TI Selenides of rare-earth elements. I. Cerium selenide and oxyselenide

AU Obolonchik, V. A.; Mikhлина, Т. М.

SO Zhurnal Prikladnoi Khimii (Sankt-Peterburg, Russian Federation) (

1965), 38(7), 1451-6

CODEN: ZPKHAB; ISSN: 0044-4618

DT Journal
LA Russian

AB The prepn. and properties of CeSe and Ce₂O₂Se were studied. In O- and N-free Ar the reaction of CeO₂ with Se was negligible at 800-900°. At 1100-1200° almost pure Ce₂O₂Se was formed; d. 6.47, sp. resistance of the order of 4 + 105 ohm-cm. Increasing the temp. to 1200° slowly or heating in air decompd. it into CeO₂ and Se. But raising the temp. rapidly to 1350° gave CeSe. CeO₂ reacted with H₂Se at 1100-1200°, 5-6 hrs. to give Ce₂Se₃. Heating 2 hrs. at 1100° gave impure CeSe. Heating Ce₂Se₃ in a current of H or in vacuo gave CeSe and Se.

CC 14 (Inorganic Chemicals and Reactions)

IT 12014-83-4P, Cerium selenide, CeSe 12014-92-5P, Cerium oxide selenide, Ce₂O₂Se
(prepn. and properties of)

=> D L44 1-23 BIB ABS HITSTR HITIND

L44 ANSWER 1 OF 23 HCA COPYRIGHT 2007 ACS on STN

AN 138:6970 HCA Full-text

TI High strength magnesium-based glass matrix composites

AU Bartusch, Birgit; Schurack, Frank; Eckert, Jurgen

CS IFW Dresden, Institute for Metallic Materials, Dresden, D-01171, Germany

SO Materials Transactions (2002), 43(8), 1979-1984

CODEN: MTARCE; ISSN: 1345-9678

PB Japan Institute of Metals

DT Journal

LA English

AB Magnesium-based glass matrix composites contg. oxide particles were produced by mech. alloying of Mg55Cu30Y15 elemental powder mixts. with the addn. of Mg₂, CeO₂, Cr₂O₃, or Y₂O₃ oxide particles. Formation of the glassy phase was characterized by x-ray diffraction and TEM and was found to proceed almost unaffected by the presence of the oxides. Differential scanning calorimetry revealed that the amorphous matrix features a wide supercooled liq. region with an extension of .apprx.40-50 K. Difference in the thermal stability of the composites depending on the oxide addn. is discussed. Viscosity measurements proved the existence of a characteristic min. of viscosity in this temp. range which was used to consolidate the powders into bulk samples by uniaxial hot pressing. The deformation behavior under compression at room temp. as well as at elevated temp. of 423 K yielded excellent properties compared to conventionally produced magnesium-based alloys.

IT 1306-38-3, Cerium oxide (CeO₂), properties
(metal matrix composite constituent; microstructure and mech.
properties of high strength amorphous magnesium alloy - metal
oxide composites produced by mech. alloying)
RN 1306-38-3 HCA
CN Cerium oxide (CeO₂) (CA INDEX NAME)



CC 56-4 (Nonferrous Metals and Alloys)
IT 1306-38-3, Cerium oxide (CeO₂), properties 1308-38-9,
Chromium oxide (Cr₂O₃), properties 1309-48-4, Magnesium oxide
(MgO), properties 1314-36-9, Yttrium oxide (Y₂O₃), properties
(metal matrix composite constituent; microstructure and mech.
properties of high strength amorphous magnesium alloy - metal
oxide composites produced by mech. alloying)
RE.CNT 28 THERE ARE 28 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L44 ANSWER 2 OF 23 HCA COPYRIGHT 2007 ACS on STN
AN 136:78772 HCA Full-text
TI Hydrothermal synthesis of metal oxide nanoparticles at supercritical
conditions
AU Adschirri, Tadafumi; Hakuta, Yukiya; Sue, Kiwamu; Arai, Kunio
CS Department of Chemical Engineering, Tohoku University, Sendai,
980-8579, Japan
SO Journal of Nanoparticle Research (2001), 3(2-3), 227-235
CODEN: JNARFA; ISSN: 1388-0764
PB Kluwer Academic Publishers
DT Journal
LA English
AB Hydrothermal synthesis of CeO₂ and Al₂O₃ were conducted using a
flow type app. over the range of temp. from 523 to 673 K at 30 MPa.
Nanosize crystals were formed at supercrit. conditions. The
mechanism of nanoparticle formation at supercrit. conditions is
discussed based on the metal oxide solv. and kinetics of the
hydrothermal synthesis reaction. The reaction rate of Ce(NO₃)₃ and
Al(NO₃)₃ was evaluated using a flow type reactor. The Arrhenius plot
of the 1st order rate const. fell on a straight line in the subcrit.
region, while it deviated from the straight line to the higher values
above the crit. point. The solv. of Ce(OH)₃ and Al₂O₃ was estd. by
using a modified HKF model in a wide range of pH and temp. In acidic
conditions, where hydrothermal synthesis reaction is concerned, solv.
gradually decreased with increasing temp. and then drastically

dropped above the crit. point. The trend of the solv. and the kinetics around the crit. point could be explained by taking account of the dielec. const. effect on the reactions. There are two reasons why nanoparticle are formed at supercrit. conditions. Larger particles are produced at subcrit. conditions due to Ostwald ripening; that could not be obsd. in supercrit. H₂O because of the extremely low solv. Second reason is the faster nucleation rate in supercrit. H₂O because of the lower solv. and the extremely fast reaction rate.

IT 1306-38-3P, Cerium oxide (CeO₂)
(hydrothermal synthesis of metal oxide nanoparticles at
supercrit. conditions)
RN 1306-38-3 HCA
CN Cerium oxide (CeO₂) (CA INDEX NAME)



CC 78-2 (Inorganic Chemicals and Reactions)
Section cross-reference(s): 67
ST cerium dioxide nanoparticle hydrothermal
prep; aluminum hydroxide oxide nanoparticle hydrothermal
prep; kinetics hydrothermal reaction aluminum hydroxide oxide
cerium dioxide prep
IT 1306-38-3P, Cerium oxide (CeO₂)
(hydrothermal synthesis of metal oxide nanoparticles at
supercrit. conditions)
RE.CNT 26 THERE ARE 26 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L44 ANSWER 3 OF 23 HCA COPYRIGHT 2007 ACS on STN
AN 136:62993 HCA Full-text
TI Synthesis of perovskite-related layered AnBnO_{3n+2} = ABO_x type
niobates and titanates and study of their structural, electric and
magnetic properties
AU Lichtenberg, F.; Herrnberger, A.; Wiedenmann, K.; Mannhart, J.
CS Institute of Physics, Center for Electronic Correlations and
Magnetism, University of Augsburg, Augsburg, D-86135, Germany
SO Progress in Solid State Chemistry (2001), 29(1-2), 1-70
CODEN: PSSTAW; ISSN: 0079-6786
PB Elsevier Science Ltd.
DT Journal

- LA English
- AB ABO_x niobates and titanates belonging to the homologous series AnBnO_{3n+2} are a special group of perovskite-related layered materials. These oxides comprise the highest-T_c ferroelectcs. such as CaNbO_{3.50} and LaTiO_{3.50}, as well as thermodynamically stable bulk compds. involving well-ordered stacking sequences of layers with different thickness such as SrNbO_{3.45}. An extensive overview on many ABO_x compns. of the AnBnO_{3n+2} family and its properties is presented. The crystal structure type is given by n and can be tuned by adjusting the oxygen content X. The charge carrier concn. of the elec. conducting oxides can be varied by appropriate substitutions at the A or B site. To study the properties of these systems, >150 different compns. were prep'd. Most of them were grown by floating zone melting, of which many were fabricated as single crystals with precise control of the oxygen content X. For these cryst. compds., the synthesis, structural, elec. and magnetic features are discussed. Attempts to prep. series members beyond the known structure types n = 4, 4.33, 4.5, 5 and 6 were not successful. For some of the known structures types n, however, pronounced nonstoichiometric homogeneity ranges with respect to the oxygen content X and cation ratio A/B were found. Thus, these systems offer many possibilities to vary the compositional, structural, chem. and phys. properties. Further, measurements of the resistivity as a function of temp. T are reported for crystals of the n = 4 type Sr_{0.8}La_{0.2}NbO_{3.50}, n = 4.5 type Sr_{0.96}Ba_{0.04}NbO_{3.45} and n = 5 types Sr_{1-Y}La_YNbO_{3.41} (Y = 0, 0.035, 0.1), Sr_{0.95}NbO_{3.37}, CaNbO_{3.41} and LaTiO_{3.41}. These measurements, which were performed in the temp. range 4 K ≤ T ≤ 290 K and along the a-, b- and c-axis, revealed a highly anisotropic cond. and intricate behavior. In parts of the temp. range , these materials are quasi-1D metals which display temp.-driven metal-semiconductor transitions at lower temps. The niobates and titanates studied represent a new group of quasi-1D metals which are in compositional, structural and electronical proximity to nonconducting layered (anti)ferroelectcs. Also, measurements of the magnetic susceptibility as a function of temp. are reported for many compds. As a typical property at elevated temps ., the magnetic susceptibility rises with increasing temp.
- IT 1306-38-3, Cerium oxide (CeO₂), reactions
(reactant for prepn. of perovskite-related layered
AnBnO_{3n+2} = ABO_x type niobates/titanates)
- RN 1306-38-3 HCA
- CN Cerium oxide (CeO₂) (CA INDEX NAME)

O—Ce—O

CC 78-2 (Inorganic Chemicals and Reactions)
Section cross-reference(s): 75, 76, 77

IT 471-34-1, Calcium carbonate (CaCO₃), reactions 513-77-9, Barium carbonate (BaCO₃) 1306-38-3, Cerium oxide (CeO₂), reactions 1312-81-8, Lanthanum oxide (La₂O₃) 1313-96-8, Niobium oxide (Nb₂O₅) 1314-23-4, Zirconium oxide (ZrO₂), reactions 1314-61-0, Tantalum oxide (Ta₂O₅) 1633-05-2, Strontium carbonate (SrCO₃) 7440-03-1, Niobium, reactions 12137-20-1, Titanium oxide (TiO) 13463-67-7, Titanium oxide (TiO₂), reactions (reactant for prepn. of perovskite-related layered AnBnO_{3n+2} = ABO_x type niobates/titanates)

RE.CNT 75 THERE ARE 75 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L44 ANSWER 4 OF 23 HCA COPYRIGHT 2007 ACS on STN
AN 134:373605 HCA Full-text

TI XANES study on the valence transitions in cerium oxide nanoparticles
AU Zhang, Jing; Wu, Ziyu; Liu, Tao; Hu, Tiandou; Wu, Zhonghua; Xin, Ju
CS Institute of High Energy Physics, Beijing Synchrotron Radiation Facility, Chinese Academy of Sciences, Beijing, 100039, Peop. Rep. China
SO Journal of Synchrotron Radiation (2001), 8(2), 531-532
CODEN: JSYRES; ISSN: 0909-0495
PB Munksgaard International Publishers Ltd.
DT Journal
LA English
AB The aim of this work is the detn. of Ce environment and valence state in Ce oxide nanoparticles prepd. by the microemulsion method. X-ray absorption near-edge structure measurements at Ce L3 edge were performed on the nanoparticles as a function of annealing temp., ranging from 298 K to 873 K under air condition. The exptl. results support the conclusion that Ce ion, in the studied systems, is in trivalence state when the annealing temp. is <473 K. As the temp. increases up to 623 K, the XANES spectrum shows the coexistence of Ce³⁺ and Ce⁴⁺ states. When the temp. is >623 K, the spectra become identical to that of CeO₂ with a distinct double-peak structure, corresponding to the Ce⁴⁺ state.

IT 1306-38-3DP, Cerium dioxide, oxygen-deficient, properties (XANES study on valence transitions in cerium oxide nanoparticles)

RN 1306-38-3 HCA
CN Cerium oxide (CeO₂) (CA INDEX NAME)



CC 73-6 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)

IT 1306-38-3DP, Cerium dioxide, oxygen-deficient, properties
(XANES study on valence transitions in cerium oxide nanoparticles)

RE.CNT 8 THERE ARE 8 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L44 ANSWER 5 OF 23 HCA COPYRIGHT 2007 ACS on STN

AN 133:312518 HCA Full-text

TI Thermal expansion of Gd-doped ceria and reduced ceria

AU Hayashi, H.; Kanoh, M.; Quan, C. J.; Inaba, H.; Wang, S.; Dokiya, M.; Tagawa, H.

CS Faculty of Education, Department of Science Education, Chiba University, Chiba-shi, 263-8522, Japan

SO Solid State Ionics (2000), 132(3,4), 227-233
CODEN: SSIOD3; ISSN: 0167-2738

PB Elsevier Science B.V.

DT Journal

LA English

AB The thermal expansion coeffs. of CeO₂ and Gd-doped ceria were measured at 100-873 K and those of reduced ceria were measured at 100-323 K. The thermal expansion coeff. of Ce_{1-x}Gd_xO_{2-x/2} increased with increasing dopant content. The thermal expansion coeff. of reduced ceria increased with increasing oxygen vacancy content. These thermal expansion increases result from weakening binding energy due to the increase of oxygen vacancies. The thermal expansion coeffs. of CeO₂ and Gd-doped ceria were calc'd. theor. and they were in good agreement with exptl. ones except for the higher temp. range.

IT 1306-38-3, Cerium oxide (CeO₂), processes
(ceramics; effects of oxygen vacancy formation via
redn. and Gd doping on thermal expansion of ceria ceramics)

RN 1306-38-3 HCA

CN Cerium oxide (CeO₂) (CA INDEX NAME)

O=Ce=O

CC 57-2 (Ceramics)
Section cross-reference(s): 52, 76

IT 1306-38-3, Cerium oxide (CeO₂), processes 117655-32-0,
Cerium gadolinium oxide Ce0.8Gd0.201.9 152233-89-1, Cerium
gadolinium oxide Ce0.9Gd0.101.95

(ceramics; effects of oxygen vacancy formation via
redn. and Gd doping on thermal expansion of ceria ceramics)

RE.CNT 22 THERE ARE 22 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L44 ANSWER 6 OF 23 HCA COPYRIGHT 2007 ACS on STN

AN 132:112445 HCA Full-text

TI Waste incinerator and waste incineration capable of suppressing
dioxin emission

IN Kajikawa, Osamu; Sato, Tominori

PA Osaka Gas Co., Ltd., Japan

SO Jpn. Kokai Tokkyo Koho, 14 pp.

CODEN: JKXXAF

DT Patent

LA Japanese

FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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PI JP 2000024437 A 20000125 JP 1998-196161

199807
10

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PRAI JP 1998-196161 19980710 <--

AB This incinerator comprises an incineration part for incinerating wastes and emitting an incinerator flue gas, a bag filter for treating the incinerator flue gas, and a discharge part for discharging the incinerator flue gas treated by the bag filter: and the bag filter comprises a filter part resistant to heat in a temp. range exceeding the dioxin prodn. temp. Waste incineration involves steps of incinerating wastes and removing powder dust, e.g. fly ashes, from the resultant incinerator flue gas by the bag filter. The incinerator may further comprise a catalytic treatment part comprising a catalyst support of an activated C fiber, Au as a 1st catalytic component, and specified metal oxides as 2nd catalytic components. Cl-contg. org. compds. including dioxin precursors and dioxins are decompd. and removed by removing dust and fly ash by the bag filter at the temp. higher than the dioxin prodn. temp.

IT 1306-38-3, Cerium oxide, uses

(catalyst for oxidn. and decompn.; waste incineration and incinerator capable of suppressing dioxin prodn. by removing fly ash by bag filter at high temp.)

RN 1306-38-3 HCA

CN Cerium oxide (CeO₂) (CA INDEX NAME)

O==Ce==O

IC ICM B01D046-02
ICS B01D051-10; B01D053-86; B01J023-58; B01J023-89; F23G005-44
CC 60-4 (Waste Treatment and Disposal)
Section cross-reference(s): 47, 67
IT 1306-38-3, Cerium oxide, uses 1309-37-1, Ferric oxide,
uses 1309-48-4, Magnesium oxide, uses 1312-43-2, Indium oxide
1312-81-8, Lanthanum oxide 1313-99-1, Nickel oxide, uses
1314-13-2, Zinc oxide, uses 1314-23-4, Zirconium oxide, uses
1314-36-9, Yttrium oxide, uses 1332-29-2, Tin oxide 1344-28-1,
Aluminum oxide, uses 1344-70-3, Copper oxide 7440-57-5, Gold,
uses 7631-86-9, Silicon oxide, uses 11098-99-0, Molybdenum oxide
11104-61-3, Cobalt oxide 11129-60-5, Manganese oxide 12627-00-8,
Niobium oxide 13463-67-7, Titanium oxide, uses
(catalyst for oxidn. and decompn.; waste incineration and
incinerator capable of suppressing dioxin prodn. by
removing fly ash by bag filter at high temp.)

L44 ANSWER 7 OF 23 HCA COPYRIGHT 2007 ACS on STN
AN 131:340627 HCA Full-text
TI Preparation of ultrafine ceric oxide particles by different methods.
I. Sol-gel method
AU Hou, Wenhua; Xu, Lin; Qiu, Jinheng; Guo, Canxiong; Chen, Ligang;
Yan, Qijie
CS Department of Chemistry, Nanjing University, Nanjing, 210093, Peop.
Rep. China
SO Nanjing Daxue Xuebao, Ziran Kexue (1999), 35(4), 486-490
CODEN: NCHPAZ; ISSN: 0469-5097
PB Nanjing Daxue
DT Journal
LA Chinese
AB Ultrafine CeO₂ particles were prep'd. by sol-gel method using citric acid as complexing agent. The influence of prepn. conditions such as molar ratio of Ce³⁺ and citric acid; reaction temp., pH value, drying temp. of the gel, calcination temp. and time of xerogel on the particle size and sp. surface area has been studied in detail. XRD, TEM, DTA and BET surface area measurements were used for the sample characterization. It is found that the molar ratio of Ce³⁺ and citric acid has a significant effect on the particle size, dispersion state and surface area of CeO₂ sample. As the ligand amt. increases, the product diam. increases and surface area decreases but better homogeneity is obtained. The best Ce³⁺/citric ratio is 1:3. The pH value of the soln. needs to keep <0, otherwise the particle size would be larger than 100 nm and inhomogeneous. Four different reaction temps. (55, 65, 75 and 85°C) were selected to study the

reaction temp. effect on the gel formation. The result shows that homogeneous gel can be formed at $\leq 65^{\circ}\text{C}$ and the gelation increases with decreasing temp.; the best reaction temp. is 65°C . DTA anal. of the dried gel shows that there are two exothermic peaks at 135 and 270°C , representing the decompn. of HNO_3 and citric acid, resp. After calcination at 320°C for 2 h, ultrafine dispersed CeO_2 can be obtained. The particles begin to aggregate at $>500^{\circ}\text{C}$ and sinter at $>800^{\circ}\text{C}$. Calcination time also affects the ultrafine particle size; at 320°C calcined for 8 h, the particles begin to aggregate. XRD spectra shows that after calcination at 250°C characteristic peaks of CeO_2 occur, and the intensity of these characteristic peaks for CeO_2 increases with increasing temp. The above results suggest that too high/too low/too long calcination temp./time are not suitable for ultrafine particle prepn. The optimum prepn. conditions are as follows: Ce^{3+} /citric acid 1:3, reaction temp. 65°C , $\text{pH} < 0$, gel drying temp. 65°C , calcination temp./time $320^{\circ}/2$ h. Under these conditions, monodispersed ultrafine CeO_2 particles with av. particles size 10 nm and surface area 57 m²/g were obtained.

IT 1306-38-3P, Cerium oxide (CeO_2)
(, preparation
(powders; effects of sol-gel process parameters on particle size
and sp. surface area of ultrafine CeO_2 particles)
RN 1306-38-3 HCA
CN Cerium oxide (CeO_2) (CA INDEX NAME)



CC 57-2 (Ceramics)
IT 1306-38-3P, Cerium oxide (CeO_2)
(, preparation
(powders; effects of sol-gel process parameters on particle size
and sp. surface area of ultrafine CeO_2 particles)

L44 ANSWER 8 OF 23 HCA COPYRIGHT 2007 ACS on STN
AN 131:148041 HCA Full-text
TI Process for manufacturing melt-textured volume probes based on
samarium barium copper oxide ($\text{Sm}_1\text{Ba}_2\text{Cu}_3\text{O}_7$; Sm-123) high-temperature
superconductors
IN Kaiser, Axel; Bornemann, Hans; Burgkhardt, Thomas; Hennig, Wolfgang
PA Forschungszentrum Karlsruhe G.m.b.H., Germany
SO Ger., 6 pp.
DT CODEN: GWXXAW
LA Patent
German

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	DE 19748743	C1	19990819	DE 1997-19748743	

199711
05

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PRAI DE 1997-19748743 19971105 <--

AB This process, in which the final product contains Sm-123 \geq 50 and Sm-211 5-50 and/or Nd-422 0-45 and/or Y-211 0-45 wt.%, comprises (A) prepg. a base mixt. for the greenware using as matrix-forming powder Sm_{1.8-1.0}Ba_{2-y}Cu_{3-z}O_{7-x} ($0 < x < 0.5$; $-0.2 < y < 0.2$; $0.3 < z < 0.3$) mixed with Sm₂O₃ 0-20 and/or Sm₂BaCuO₅ (Sm-211) 0-50 and/or Y₂BaCuO₅ (Y-211) 0-45 and/or Nd₄Ba₂Cu₂₀ (Nd-422) 0-45 wt.%, and, if not already mixed with the starting material, adding as additive Pt_{0.2} or Pt 0.1-1 and/or CeO₂ or Ce 0.1-2 and/or Rh₂O₃ or Rh 0.005-1 and/or Ag₂O or AgO 0-6 and/or Yb₂O₃ 0-2 wt.%, and adding (to max. 17 wt.%) CuO 0-4 and/or BaCuO_x 0-6 and/or BaO 0-5 and/or CaO 0-2 and/or MgO 0-2 and/or Al₂O₃ 0-2 and/or BaZrO₃ (or, correspondingly, BaO + ZrO₂) 0-15 and/or ZrO₂ 0-1 and/or V₂O₅ 0-1 and/or TiO₂ 0-1 and/or Nb₂O₅ 0-1 and/or Sb₂O₃ 0-1 and/or Bi₂O₃ 0-1 wt.%, using (optionally different) particle sizes in the range of 4 nm to 80 μ m, (B) homogenizing the mixt. in, e.g., a ball mill, during which a C uptake of \leq 0.18 wt.%, via atm. CO₂ and/or from an org. binder, is allowable, (C) molding and densifying the mixt., and (D) melt-texturizing the greenware by providing a Nd-123, Sm-123, MgO, or corresponding-type seed crystal whose decompn. temp. is higher than the max. temp. of the heat treatment. The greenware is then subjected to a temp. program in which the greenware is heated at 400 degree/h to 800°, further heated at 300 degree/h to T_{max} (T_{max} is .apprx.1020° at 0 partial pressure 80 Pa, or 1050° at 0 partial pressure 800 Pa), held at T_{max} for \leq 30 min, cooled (rapidly) at 500 degree/h to .apprx.980° at 0 partial pressure 800 Pa, or to 960° at 0 partial pressure 80 Pa, cooled (slowly) at 1-2 degree/h to .apprx.880° at 0 partial pressure 800 Pa, or to 885° at 0 partial pressure 80 Pa, further cooled at 60 degree/h to 800°, and cooled to ambient temp. at 300 degree/h. This process can be automated and permits melt-texturizing under vacuum with seed crystals of suitable texture, an provides vol. probes for use in self-stabilizing contact-free magnetic bearings.

IT 1306-38-3, Cerium dioxide, processes
 (compsn. contg.; in manuf. of melt-textured vol. probes
 based on barium copper samarium oxide high-temp. superconductors)
 RN 1306-38-3 HCA
 CN Cerium oxide (CeO₂) (CA INDEX NAME)

O==Ce==O

IC ICM C04B035-45
ICS C04B035-50
CC 57-2 (Ceramics)
Section cross-reference(s): 49, 76
IT 1301-96-8, Silver oxide (AgO) 1304-28-5, Barium oxide, processes
1304-76-3, Bismuth oxide, processes 1306-38-3, Cerium
dioxide, processes 1309-48-4, Magnesia, processes 1309-64-4,
Antimony trioxide, processes 1313-96-8, Niobium pentoxide
1314-23-4, Zirconia, processes 1314-37-0, Ytterbium oxide
1314-62-1, Vanadium pentoxide, processes 1317-38-0, Cupric oxide,
processes 1344-28-1, Aluminum oxide (Al2O3), processes
7440-06-4, Platinum, processes 7440-16-6, Rhodium, processes
7440-45-1, Cerium, processes 11129-89-8, Platinum oxide
12009-21-1, Barium zirconium oxide 12060-58-1, Samarium oxide
12680-36-3, Rhodium oxide 13463-67-7, Titania, processes
20667-12-3, Silver oxide (Ag2O) 57348-59-1, Barium copper oxide
82642-05-5, Barium copper samarium oxide (BaCuSm205) 82642-06-6,
Barium copper yttrium oxide (BaCuY205) 90804-74-3, Barium copper
neodymium oxide (BaCuNd205) 236108-66-0, Barium copper samarium
oxide (Bal.8-2.2Cu2.7-3.3Sm1-1.806.5-7)
(compns. contg.; in manuf. of melt-textured vol. probes
based on barium copper samarium oxide high-temp. superconductors)
RE.CNT 2 THERE ARE 2 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L44 ANSWER 9 OF 23 HCA COPYRIGHT 2007 ACS on STN
AN 119:144966 HCA Full-text
TI Hydrothermal synthesis and sintering of ultrafine ceria powders
AU Zhou, Y. C.; Rahaman, M. N.
CS Inst. Met. Res., Acad. Sin., Shenyang, 110015, Peop. Rep. China
SO Journal of Materials Research (1993), 8(7), 1680-6
CODEN: JMREEE; ISSN: 0884-2914
DT Journal
LA English
AB Undoped CeO₂ and Y2O₃-doped CeO₂ powders of size 10-15 nm were prepd.
under hydrothermal conditions (10 MPa at 300° for 4 h). The
compacted powders were sintered freely in air or in O₂ at const.
heating rates of 1-10 °/min up to 1350°. The undoped CeO₂ started to
sinter at 800-900° and reached a max. d. of 95% at 1200°, after
which the d. decreased slightly. Isothermal sintering at 1150°
produced a sample with a relative d. of ≈0.98 and an av. grain size
of ≈100 nm. The samples sintered above 1200° exhibited

microcracking. The decrease in d. and the microcracking above 1200°. degree. are attributed to a redox reaction leading to the formation of oxygen vacancies and the evoln. of O₂ gas. Doping with Y₂O₃ produced an increase in the temp. at which measurable sintering commenced and an increase in the sintering rate, compared with the undoped CeO₂. Sintered samples of the doped CeO₂ showed no microcracks. The CeO₂ doped with up to 3 mol% Y₂O₃ was sintered to almost full d. and with a grain size of ≈200 nm at 1400°.

IT 1306-38-3, Cerium dioxide, miscellaneous
(hydrothermal synthesis and sintering of)

RN 1306-38-3 HCA

CN Cerium oxide (CeO₂) (CA INDEX NAME)



CC 57-2 (Ceramics)

Section cross-reference(s): 49

IT 1306-38-3, Cerium dioxide, miscellaneous
(hydrothermal synthesis and sintering of)

L44 ANSWER 10 OF 23 HCA COPYRIGHT 2007 ACS on STN

AN 117:54296 HCA Full-text

TI On the sintering behavior of 12 mol% ceria-stabilized zirconia

AU Annamalai, V. E.; Gokularathnam, C. V.; Krishnamurthy, R.

CS Dep. Met. Eng., Indian Inst. Technol., Madras, 600 036, India

SO Journal of Materials Science Letters (1992), 11(10), 642-4

CODEN: JMSLD5; ISSN: 0261-8028

DT Journal

LA English

AB The sintering of 12 mol% CeO₂-stabilized ZrO₂ was studied to ascertain the exact sintering schedule, with well-defined heating and cooling rates, that can develop a fully tetragonal structure. A single-phase 100% tetragonal structure was obtained by sintering at 1350° for 2 h. From this temp., air-quenching can result in a higher d. Sintering at higher temps. leads to a mixed monoclinic-tetragonal structure. The higher the temp. the greater the amt. of monoclinic phase. When sintered at 1600° for 12 h, the CeO₂-ZrO₂ turns amorphous. This amorphous zirconia can be converted to 100% tetragonal phase by heat treatment at 400° for 2 h and then quenching in air.

IT 1306-38-3, Ceria, uses
(zirconia ceramics stabilized by, sintering of, tetragonal phase formation in)

RN 1306-38-3 HCA

CN Cerium oxide (CeO₂) (CA INDEX NAME)



CC 57-2 (Ceramics)
IT 1306-38-3, Ceria, uses
(zirconia ceramics stabilized by, sintering of, tetragonal phase formation in)

L44 ANSWER 11 OF 23 HCA COPYRIGHT 2007 ACS on STN

AN 110:197652 HCA Full-text

TI Manufacture of formed parts from brittle materials

IN Nickl, Julius J.

PA Fed. Rep. Ger.

SO Ger. Offen., 4 pp.

CODEN: GWXXBX

DT Patent

LA German

FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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PI DE 3726037 A1 19890216 DE 1987-3726037

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PRAI DE 1987-3726037 19870805 <--

AB Wires, bands, or tubes from metal borides, carbides, oxides, or sulfides for use in electronics and for manuf. of composites are prep'd. by alloying appropriate metals and/or their master alloys (via melting or powder metallurgy); forming them into desired shape; complete or partial boriding, carburizing, oxidizing, and/or sulfiding the formed parts; and encasing or impregnating them with metals or by extruding a paste of the brittle materials and esp. oxides with ≥1 fine wire, strengthening at higher temp., and by encasing or impregnating with metals. A paste of BaO, CeO₂, and TiO₂ contg. .apprx.0.1% CuO was extruded with a Ni or Cu core and heated at 800° in H to obtain a solid and strong oxide wire. The strengthening oxides and sulfides comprise oxides and sulfides, which are reducible with H at .1torsim.1000.degree ..

IT 1306-38-3, Cerium dioxide, uses and miscellaneous
(manuf. of formed parts contg., for
composites and electronics)

RN 1306-38-3 HCA

CN Cerium oxide (CeO₂) (CA INDEX NAME)



IC ICM C23F017-00
ICS C04B035-00; H05K003-10; H01B012-00
ICA C04B035-02; C04B035-46; C04B035-52; C04B035-58
CC 56-4 (Nonferrous Metals and Alloys)
Section cross-reference(s): 57, 76
IT 1304-28-5, Barium oxide, uses and miscellaneous 1306-38-3,
Cerium dioxide, uses and miscellaneous 13463-67-7, Titanium
dioxide, uses and miscellaneous
(manuf. of formed parts contg., for
composites and electronics)

L44 ANSWER 12 OF 23 HCA COPYRIGHT 2007 ACS on STN

AN 110:10654 HCA Full-text

TI High-surface area ceric oxide and its manufacture

IN David, Claire; Magnier, Claude; Latourrette, Bertrand

PA Rhone-Poulenc Chimie SA, Fr.; Rhone-Poulenc Chimie de Base

SO Fr. Demande, 20 pp.

CODEN: FRXXBL

DT Patent

LA French

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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PI	FR 2608583	A1	19880624	FR 1986-17805	198612 19
				<--	
FR	2608583	B1	19901207		
EP	275733	A1	19880727	EP 1987-402794	198712 09
				<--	
EP	275733	B1	19910925		
	R: AT, BE, CH, DE, ES, FR, GB, GR, IT, LI, LU, NL, SE				
AT	67746	T	19911015	AT 1987-402794	198712 09
				<--	
AU	8782803	A	19880623	AU 1987-82803	

198712
18

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AU 600061 B2 19900802
BR 8706916 A 19880726 BR 1987-6916

198712
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JP 63239109 A 19881005 JP 1987-319118

198712
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CA 1323359 C 19931019 CA 1987-554822

198712
18

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US 4859432 A 19890822 US 1987-135380

198712
21

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PRAI FR 1986-17805 A 19861219 <--
EP 1987-402794 A 19871209 <--

AB The title CeO₂, having surface area of \geq 100 m²/g after calcination at 350-450°, has pore vol. \geq 0.30 cm³/g and pore diam. $>$ 50 Å. The CeO₂ is prepd. from Ce hydroxide by reacting a Ce salt with a strong base in the presence of carboxylate ions, or by reacting a Ce carboxylate with a strong base, and sepg., washing, and heat-treating the resulting ppt. This CeO₂ is useful as a catalyst for the manuf. of MeOH or in the treatment of waste gases. Thus, 1000 cm³ 4.25 N aq. soda soln. was fed into a jacketed reactor, and a mixt. of 175 cm³ aq. soln. of Ce nitrate (2.85 mol/L) and 150 g 17.5 N HOAc was added over 20 min under stirring. The temp. was raised to 90° and maintained at 90. degree. for 3 h. After cooling, 38 cm³ oxygenated water (9.8 mol/L) was added to the resultant Ce hydroxide slurry, and the mixt. was stirred at 70° for .apprx.1 h. After filtration, the ppt. was twice reslurried in water 100 g/L, and a 3rd time in HNO₃ of pH 3. The ppt. was then filtered off, and dried at 100° for 24 h to give 89 g product contg. 92% CeO₂ that was calcined at 400° for 6 h to give a product having crystal diam. 45 Å, Brunauer-Emmet-Teller surface area .apprx.145 m²/g, pore vol. for pores of $<$ 1000 Å 0.42, and of pores $<$ 200 Å, 0.32 g/cm³, pore diam. 20-1000 Å, and residual Na content 0.16%.

IT 1306-38-3P, Cerium diozide,
preparation

(prepa. of high-surface area, for catalysts)

RN 1306-38-3 HCA

CN Cerium oxide (CeO₂) (CA INDEX NAME)



- IC ICM C01F017-00
ICS B01J023-10; B01J035-00
CC 49-3 (Industrial Inorganic Chemicals)
Section cross-reference(s): 23, 45, 67
IT Catalysts and Catalysis
 (cerium dioxide, prepn. of
 high-surface area, for methanol synthesis)
IT 7732-18-5, Water, properties
 (oxygenated, in high-surface area cerium
 dioxide manuf.)
IT 37382-23-3
 (pptn. of, in presence of carboxylate ions, in high-surface area
 cerium dioxide manuf.)
IT 1306-38-3P, Cerium dioxide,
preparation
 (pprn. of high-surface area, for catalysts)
IT 17309-53-4
 (reaction of, with alkali, in presence of carboxylate ions, in
 high-surface area cerium dioxide
 manuf.)
IT 537-00-8, Cerium(III) acetate 14536-00-6 56797-01-4 68084-49-1
 (reaction of, with strong alkali, in high-surface area
 cerium dioxide manuf.)
IT 64-17-5, Ethanol, properties 67-56-1, Methanol, properties
67-63-0, Isopropanol, properties 67-64-1, Acetone, properties
71-23-8, Propanol, properties
 (solvent, in high-surface area cerium dioxide
 manuf.)

L44 ANSWER 13 OF 23 HCA COPYRIGHT 2007 ACS on STN

AN 108:158825 HCA Full-text

TI Activated rare earth borate, x-ray intensifying phosphors, their
preparation, and x-ray intensifying screens using them

IN Page, Catherine Jo

PA du Pont de Nemours, E. I., and Co., USA

SO Eur. Pat. Appl., 9 pp.

CODEN: EPXXDW

DT Patent

LA English

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	EP 256535	A1	19880224	EP 1987-111792	198708 14
				<--	
	EP 256535	B1	19900919		
	R: BE, CH, DE, FR, GB, LI, LU, NL				
	JP 63048387	A	19880301	JP 1987-201976	198708 14
				<--	
	JP 03002473	B	19910116		
	US 4883970	A	19891128	US 1988-284424	198812 14
				<--	
PRAI	US 1986-897040	A	19860815	<--	
	US 1987-95229	A3	19870911	<--	
AB	The title phosphors comprise Gd _{1-x} BO ₃ :Ce _x ($x = 0.001-0.09$). A mixt. of Gd ₂ O ₃ 68.540, CeO ₂ 0.660, B ₂ O ₃ 13.306, NaCl 26.420, and Na ₂ B ₄ O ₇ 14.446 g was prepnd., placed in an Al ₂ O ₃ crucible, and put into an oven where the temp. was increased at 10°/min until a temp. of 900° was reached. The temp. was maintained at 900.degree. for 12 h and then lowered at 4°/min, after which the resulting powder was dissolved and washed in boiled, distd. H ₂ O under N ₂ to remove the flux. The material was then vacuum-dried at 50°, sieved through a 325 mesh screen, dispersed in a conventional x-ray screen binder, coated onto a support at a dry coating thickness of 0.25 mm, and covered with a conventional topcoat to produce an x-ray screen. Exposures were then made using a conventional fine grain blue-sensitive medical x-ray film used in mammog. The screen was somewhat slower than a com. DuPont Quanta III x-ray screen; however it showed a decrease in noise of .apprx.5% and an increase of >40% in resoln. in comparison to the Quanta III screen.				
IT	1306-38-3, Cerium oxide (CeO ₂), uses and miscellaneous (in prepn. of cerium-activated gadolinium borate phosphors)				
RN	1306-38-3	HCA			
CN	Cerium oxide (CeO ₂)	(CA INDEX NAME)			

O==Ce==O

IC ICM C09K011-78
ICS G21K004-00
CC 73-5 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)
Section cross-reference(s): 8, 74
IT 1303-86-2, Boron oxide (B₂O₃), uses and miscellaneous
1306-38-3, Cerium oxide (CeO₂), uses and miscellaneous
12292-85-2, Gadolinium oxide (GdO₃)
(in prepn. of cerium-activated gadolinium borate phosphors)

L44 ANSWER 14 OF 23 HCA COPYRIGHT 2007 ACS on STN

AN 106:142865 HCA Full-text

TI Compositions for, and manufacture and properties of, high-density sintered aluminum nitride

IN Taniguchi, Hitofumi; Kuramoto, Nobuyuki

PA Tokuyama Soda Co., Ltd., Japan

SO Ger. Offen., 18 pp.

CODEN: GWXXBX

DT Patent

LA German

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	DE 3627317	A1	19870219	DE 1986-3627317	198608 12
				<--	
	DE 3627317	C2	19890420		198508
	JP 62041766	A	19870223	JP 1985-176865	13
				<--	
	JP 05069793	B	19931001		198510
	JP 62105960	A	19870516	JP 1985-241348	30
				<--	
	JP 05017190	B	19930308		198511
	JP 62108774	A	19870520	JP 1985-248797	08
				<--	
	JP 05035109	B	19930525		198511
	JP 62108775	A	19870520	JP 1985-248798	08
					198511

			<--
JP 04060078 CA 1262149	B A1	19920925 19891003	CA 1986-515762 198608 12
GB 2179677	A	19870311	GB 1986-19705 198608 13
GB 2179677 GB 2213500	B A	19900530 19890816	GB 1989-4805 198903 02
GB 2213500 US 5063183	B A	19900530 19911105	US 1990-569369 199008 14
PRAI JP 1985-176865 JP 1985-241348 JP 1985-248797 JP 1985-248798 US 1986-894256 GB 1986-19705	A A A A B1 A3	19850813 19851030 19851108 19851108 19860807 19860813	<-- <-- <-- <-- <-- <--
AB	High-d., sintered AlN is prep'd. from finely powd. mixts. of AlN and sintering aids consisting of a halide and a non-halide compd. of rare earth metals, alk. earth metals, and Y. Preferred halogen-free alk. earth compds. are alk. earth aluminates. Powd. Y2O3 0.7, and CaF2 1.3 wt.% were mixed in EtOH with AlN powder with av. diam. 1.42 μ , contg. 97 wt.% of particles <3 μ , and with a compn. as presented. The mixt. was dried, and 1.0 g was axially pressed at 200 kg/cm ² in a 15-mm inside diam. form, and isostatically pressed at 1500 kg/cm ² to form greenware with a d. of 1.60 g/cm ³ . The temp. was raised to 1100.degree. in 40 min in N, and to 1800 at 15°/min and kept at 1800. degree. for 10 h. The d. of the sintered ware was 3.25 g/cm ³ . The thermal cond. of 3-mm-thick disks was 195 vs. 134 W/m.K for a conventional disk. The O content was 0.09, and 0.56 wt.%, resp. The light transparency of a 0.5 mm thick disk was measured with light of 6 μ wavelength and was 38%, vs. 29%, resp.		
IT	1306-38-3, Ceria, uses and miscellaneous (sintering aids, for high-d. aluminum nitride manuf.)		
RN	1306-38-3 HCA		
CN	Cerium oxide (CeO ₂) (CA INDEX NAME)		

O==Ce==O

IC ICM C04B035-58
ICS C04B035-64; C01B021-072; B22F003-10; C22C029-16
ICA H01L023-14
CC 57-2 (Ceramics)
IT 471-34-1, Calcium carbonate, uses and miscellaneous 563-72-4
1304-28-5, Barium oxide, uses and miscellaneous 1305-78-8, Calcia,
uses and miscellaneous 1306-38-3, Ceria, uses and
miscellaneous 1312-81-8 1314-11-0, Strontia, uses and
miscellaneous 1314-36-9, Yttria, uses and miscellaneous
7783-48-4, Strontium fluoride 7789-41-5, Calcium bromide
7789-75-5, Calcium fluoride, uses and miscellaneous 10124-37-5,
Calcium nitrate 10476-86-5, Strontium iodide 10553-31-8, Barium
bromide 12004-05-6 12004-40-9 12004-88-5 12005-26-4
12005-57-1 12042-68-1 12042-78-3, Calcium aluminate (Al₂Ca₃O₆)
12060-58-1, Samarium oxide (Sm₂O₃) 13536-79-3, Lanthanum bromide
13709-38-1 13709-49-4, Yttrium fluoride 13718-50-8, Barium
iodide 13813-25-7 37317-01-4, Cerium fluoride
(sintering aids, for high-d. aluminum nitride manuf.)

L44 ANSWER 15 OF 23 HCA COPYRIGHT 2007 ACS on STN

AN 106:104236 HCA Full-text

TI Hydrogenation of carboxylic acid esters to alcohols

IN Williams, Peter Sefton

PA BP Chemicals Ltd., UK

SO Eur. Pat. Appl., 17 pp.

CODEN: EPXXDW

DT Patent

LA English

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
	-----	----	-----	-----	
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PI	EP 210795	A1	19870204	EP 1986-305527	198607 17 -----
	EP 210795	B1	19900502		
	R: AT, BE, DE, FR, GB, IT, LU, NL, SE				
	AT 53828	T	19900615	AT 1986-305527	198607 17 -----

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AU 8660376

A

19870129

AU 1986-60376

198607
21

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AU 596980
CN 86105765

B2

19900524

A

19870128

CN 1986-105765

198607
23

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JP 62063533

A

19870320

JP 1986-173533

198607
23

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PRAI GB 1985-18576
EP 1986-305527

A

19850723 <--

A 19860717 <--

AB Alcs. are prepd. by the hydrogenation of a carboxylate ester at elevated temps. and atm. or elevated pressure in the presence of a reductively activated Cu_aM₁M₂B_xO_y (A = alkali metal; M₁ = Mg, lanthanide metal, actinide metal; M₂ = Ca, Mo, Rh, Mn, Pt, Cr, Zn, Al, Ti, V, Ru, Re, Pd, Ag, Au; a = 0.1-4; b = 0-1.0; c = 0-0.5; x = no. which satisfies valence requirements of the other elements for O) catalyst. Cu(NO₃)₂.2.5H₂O, 3.8 g, was dissolved in 25 mL H₂O then added to 5 g MgO (BET surface area 31 m²/g) wetted with 10 mL H₂O. After standing for 17 h the water was removed, the recovered solid dried overnight at 110° in vacuo, the dried material calcined in air at 550° for 17 h at GHSV 2000, cooled, purged with N, heated under H₂ to 220° over 2 h, then held at 220. degree. for 2 h. The catalyst was then cooled under H₂ prior to passivation using N contg. trace amts. of O. EtOAc, 90.0 g, and 0.5 g of the catalyst were charged into an autoclave, the autoclave pressurized with H₂ and operated at 230°/40 bars-gage for 12 h, then cooled, and the reactor contents analyzed by gas liq. chromatog. indicating the formation of EtOH in 99% selectivity with 1.24 g/g-catalyst-h EtOH productivity.

IT 1306-38-3, Cerium dioxide, uses and miscellaneous
(catalysts, for hydrogenation of C1-24 carboxylate esters in alc.
manuf.)

RN 1306-38-3 HCA

CN Cerium oxide (CeO₂) (CA INDEX NAME)

IC ICM C07C029-136

ICS C07C031-08; B01J023-76

CC 45-4 (Industrial Organic Chemicals, Leather, Fats, and Waxes)

Section cross-reference(s): 23, 67
IT 1306-38-3, Cerium dioxide, uses and miscellaneous
1309-48-4, Magnesium oxide, uses and miscellaneous 3251-23-8,
Copper (II) nitrate 13823-29-5, Thorium nitrate
(catalysts, for hydrogenation of C1-24 carboxylate esters in alc.
manuf.)

L44 ANSWER 16 OF 23 HCA COPYRIGHT 2007 ACS on STN
AN 97:186971 HCA Full-text
TI Sintering studies on zirconia-ceria system for MHD electrodes
AU Roy, S. K.; Prasad, Ram; Rao, S. V. K.
CS Metall. Div., Bhabha At. Res. Cent., Bombay, 400 085, India
SO Proc. Symp. Sintering Sintered Prod. (1980), Meeting Date
1979, 261-9. Editor(s): Moorthy, V. K. Publisher: India Dep. Atomic
Energy, Bombay, India.
CODEN: 48JYAN
DT Conference
LA English
AB The powder prepn., sintering, and properties of ZrO₂-CeO₂ solid soln. ceramics contg. 85 ZrO₂ and 15 mol.% CeO₂ was studied in relation to their use as electrodes in MHD ducts. The effect of 5 mol.% Y₂O₃ on densification and stabilization was investigated. In the ZrO₂-CeO₂ system tetragonal solid soln. formation was virtually completed at 1250° after a sufficient time. Addn. of Y₂O₃ enhanced the rate of solid soln. formation and also helped stabilization of the cubic phase. Increased thermal treatments, i.e., higher temps. or longer times, decreased the elec. cond. Ceramics contg. 85 ZrO₂ and 15 mol.% CeO₂ had bulk d., porosity, and elec. cond. of 5.14-6.10 g/cm³, 16.73-0%, and 0.96-0.038 + 10⁻⁶/Ω-cm after sintering at 1250-1500. degree. for 5 h and 5.97-6.14 g/cm³, 2.52-0%, and 0.032-0.021 + 10⁻⁶/Ω-cm after sintering at 1250-1400. degree. for 24 h, resp. Values for ceramics contg. 5 mol.% Y₂O₃ are also given.
IT 1306-38-3D, solid solns. with zirconia
(ceramics, for electrodes in MHD ducts, prepн. and
sintering and properties in relation to)
RN 1306-38-3 HCA
CN Cerium oxide (CeO₂) (CA INDEX NAME)



CC 57-6 (Ceramics)
IT Electric generators
(MHD, electrodes in ducts of, zirconia-cerium
oxide ceramics for, prepн. and sintering and

properties in relation to)
IT 1306-38-3D, solid solns. with zirconia 1314-23-4D, solid
solns. with cerium oxide
(ceramics, for electrodes in MHD ducts, prepns. and
sintering and properties in relation to)

L44 ANSWER 17 OF 23 HCA COPYRIGHT 2007 ACS on STN
AN 97:77528 HCA Full-text
TI Nonfused aluminum oxide-based abrasive mineral
IN Leitheiser, Melvin A.; Sowman, Harold G.
PA Minnesota Mining and Manufacturing Co., USA
SO U.S., 19 pp. Cont.-in-part of U.S. Ser. No. 53,347, abandoned.
CODEN: USXXAM
DT Patent
LA English
FAN.CNT 2

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	US 4314827	A	19820209	US 1980-145383	198005 13
				<--	
	EP 24099	A1	19810225	EP 1980-302029	198006 16
				<--	
	EP 24099	B1	19840125		
	R: AT, BE, CH, DE, FR, GB, IT, NL, SE				
	CA 1145563	A1	19830503	CA 1980-354117	198006 16
				<--	
	AT 5973	T	19840215	AT 1980-302029	198006 16
				<--	
	NO 8001914	A	19801230	NO 1980-1914	198006 26
				<--	
	NO 150283	B	19840612		
	NO 150283	C	19840919		
	AU 8059712	A	19810108	AU 1980-59712	198006 27
				<--	

AU 538326	B2	19840809		
BR 8004062	A	19810121	BR 1980-4062	198006 27
<--				
JP 56032369	A	19810401	JP 1980-87704	198006 27
<--				
JP 01054300	B	19891117		
ZA 8003883	A	19810729	ZA 1980-3883	198006 27
<--				
US 4518397	A	19850521	US 1983-495179	198305 17
<--				

PRAI US 1979-53347 A2 19790629 <--
 US 1980-145383 A 19800513 <--
 EP 1980-302029 A 19800616 <--
 US 1981-311381 A1 19811014 <--

AB The prepn. of synthetic nonfused Al2O3-based abrasives having a microcryst. structure of randomly oriented crystallites comprising a dominant continuous α -Al2O3 phase with a 2nd phase contg. 1-45 ZrO2 and/or HfO2 or \geq 1% spinel and the prepn. of abrasive articles from them are described. Thus, to a dispersion of 16 N HNO3 and α -Al2O3 was added 50% aq. zirconyl acetate soln., the mixt. blended, gelled, and the gel dried at 90° to consist of granules \leq 0.5 cm diam. contg. <10% volatiles. The granules were crushed and the particles of av. diam. 0.5-5 mm retained for firing. The screened material was fired in an oxidizing atm. to 550° at 100°/h, maintained at 550 for 20 h, the temp. increased to 1350 at 200°/h, and maintained at 1350° for 5 h. The product, after cooling, consisted of opaque white granules contg. 60 Al2O3 and 40% ZrO2 which had Knoop hardness (500 g load) of 85 and in grinding tests on steel removed 0.137, 0.546, and 0.864 cm3 metal/cm2 coated abrasive wear path for abrasive grades 175, 450, and 150 μ av. diam., resp.

IT 1306-38-3, uses and miscellaneous
 (alumina abrasives contg., synthesis and properties of)

RN 1306-38-3 HCA

CN Cerium oxide (CeO2) (CA INDEX NAME)



IC C04B035-10
INCL 051298000
CC 57-7 (Ceramics)
IT 1306-38-3, uses and miscellaneous 1307-96-6, uses and
miscellaneous 1309-48-4, uses and miscellaneous 1313-99-1, uses
and miscellaneous 1314-13-2, uses and miscellaneous 1314-23-4,
uses and miscellaneous 1333-88-6 12003-84-8 12004-35-2
12032-52-9 12055-23-1 12060-58-1 12068-51-8 12252-80-1
13463-67-7, uses and miscellaneous 65405-38-1 82620-12-0
(alumina abrasives contg., synthesis and properties of)

L44 ANSWER 18 OF 23 HCA COPYRIGHT 2007 ACS on STN
AN 69:70955 HCA Full-text
TI Preparation of monocrystalline metal oxide
AU Harari, A.; Thery, J.; Collongues, R.
CS Centre Etud. Chim. Met., Vitry-sur-Seine, Fr.
SO Revue Internationale des Hautes Temperatures et des Refractaires (1967), 4(3), 207-9
CODEN: RIHTAV; ISSN: 0035-3434
DT Journal
LA French
AB The oxide of Ti, Hf, Ce, and Th were crystd. in a Na₂B₄O₇ flux, which dissolves 10-25 wt. % oxide at the temps. used. The flux is sol. in boiling or slightly acidic H₂O, thus allowing retrieval of the crystals. The flux-oxide mixt. (10 g.) was melted in a Pt crucible placed in a vertical oven with a SiC heating element. The cycle consisted of an initial, fairly rapid temp. increase beyond the crystn. temp. to ensure proper soln. of the oxide, of a prolonged evapn. stage (3-10 days) at a temp. dependent on the flux and on the eventual transformations of the dissolved oxide, and of slow cooling (5-10°/ hr.) to apprx. 900°. Needles of rutile (5-10 mm.) were obtained after soln. at 1300° and flux-evapn. at 1200°. ZrO₂ crystd. in the monoclinic system (5-8 mm. crystals) at a temp. cycle below 1150°, the evapn. stage being set at 1120°. HfO₂ crystd. in monoclinic platelets (2-3 mm.) stable up to 1700°. CeO₂ and ThO₂ formed cubes of 1-2 mm. edge. The accompanying formation of CeBO₃ and ThB₂O₅ could be avoided by operating at high temps. and an excess of B₂O₃. Besides TiO₂ and ThO₂, a compd. of the system TiO₂-ThO₂ was prep'd. ThTi₂O₆ exists in 2 forms, α and β, the transformation α → β taking place at 1300°. The structure of α (5-8 mm. needles) is unknown, and that of β is monoclinic.
IT 1306-38-3
(crystal growth of, from borax flux)
RN 1306-38-3 HCA
CN Cerium oxide (CeO₂) (CA INDEX NAME)

O==Ce==O

CC 70 (Crystallization and Crystal Structure)
IT 1306-38-3 1314-20-1, properties 1314-23-4, properties
12055-23-1 13463-67-7, properties
(crystal growth of, from borax flux)

L44 ANSWER 19 OF 23 HCA COPYRIGHT 2007 ACS on STN
AN 68:49069 HCA Full-text
TI Catalyst for the preparation of formaldehyde from methanol
IN Kupiec, Stefan
PA Zaklady Azotowe
SO Pol., 2 pp.
CODEN: POXXA7
DT Patent
LA Polish
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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PI	PL 53678		19670725	PL	
					196405
					04

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AB A catalyst showing high activity, stability, and selectivity and contg. MoO₃ activated with CeO₂ was prep'd. Thus, 10% NH₃ was added to 35 kg. Ce(SO₄)₂.4H₂O dissolved in 200 l. H₂O until pH 0.9 was attained and the soln. (A) was filtered. HCl (10%) was added to 50 kg. (NH₄)₆Mo₂₄.4H₂O dissolved in 900 l. H₂O until a soln. (B) of pH 2.6 was attained. Then, solns. A and B were added simultaneously under stirring to 200 l. HCl having pH 0.8 and temp. 65°, the stirring was stopped, and the ppt. was filtered off, washed, and dried with an air-stream at 70° in layers 30 mm. thick during 24 hrs. and then at 110° during 12 hrs. The catalyst was placed in a cylindrical reactor in such a way as to obtain a layer 350 mm. thick, air was passed through the reactor at the rate of 2,000 hr.⁻¹, the temp. was raised by 30°/ hr. up to 340°, and this temp. was maintained for 5 hrs. The product was powd. and mixed with H₂O to obtain a paste, the paste was dried at 20° in an air-stream in layers 10 mm. thick during 24 hrs. The product, contg. .apprx.8% H₂O, was ground to grain-size of .apprx.1 mm., 2% graphite was added, cylindrical pellets 5 + 5 mm. were prep'd., and the pellets were dried at 60° during 8 hrs. and then at

110. degree. during 6 hrs. A mixt. of air contg. 7% MeOH was passed over the catalyst at 270-380° at the rate of 8,000 hr.-1 and >90% of the MeOH was converted into HCHO with a selectivity of oxidn. of >96%. The catalyst was used for 0.5 year.

IT 1306-38-3
(catalyst from molybdenum oxide (MoO₃) and, for methanol oxidn.)
RN 1306-38-3 HCA
CN Cerium oxide (CeO₂) (CA INDEX NAME)



IC C07C
CC 23 (Aliphatic Compounds)
IT 1306-38-3
(catalyst from molybdenum oxide (MoO₃) and, for methanol oxidn.)

L44 ANSWER 20 OF 23 HCA COPYRIGHT 2007 ACS on STN
AN 67:75701 HCA Full-text

TI High temperature oxidation and produced oxides of iron-cerium alloys
AU Nakayama, Tadayuki; Fujikawa, Hisao
CS Waseda Univ., Tokyo, Japan
SO Nippon Kinzoku Gakkaishi (1965), 29(10), 990-5
CODEN: NIKGAV; ISSN: 0021-4876

DT Journal
LA Japanese
AB The oxidn. behavior was studied of 0.008-0.470 wt. % Ce-Fe alloys in air at high temps. (800°, 3 hrs .; 1000°, 2 hrs.), particularly the oxide layers produced on them under the same oxidn. conditions. The Ce concn. was enriched along the inner oxide layer in contact with the surface of the 0.025 wt. % Ce-Fe alloy which was oxidized at 800° for 3 hrs. At the higher temp. (1000°, 2

hrs.), the 0.470 wt. % Ce-Fe alloy was covered with the thick oxide layer of high Ce concn. The x-ray diffraction patterns obtained from inner oxide layers of the alloys contg. Ce > 0.292 wt. % after the oxidn. at 800° for 3 hrs. showed the existence of the CeFeO₃ phase (perovskite type, pseudocubic a0 3.915 Å.), besides Fe oxides. CeFeO₃ and CeO₂ crystals were also detected in inner oxide layers produced on the alloys contg. Ce > 0.232 wt. % by the higher temp . oxidn. (1000°, 2 hrs.).

CeFeO₃ crystals were not produced by sintering α-Fe₂O₃-CeO₂ and Fe₃O₄-CeO₂ mixts. in vacuum (.apprx.10-3 mm. Hg) at the same temps. as used for the oxidn. expts. of Fe-Ce alloys and at 1200° for 24 hrs. CeFeO₃

crystals, however, were observed by the x-ray diffraction method when the FeO-CeO₂ mixt. was sintered under the same conditions. The formation mechanism of CeFeO₃ crystals detected in the inner oxide layer of Fe-Ce alloys depends on the solid reaction of FeO and CeO₂ crystals at high temps.

IT 1306-38-3P
(formation of, in oxidn. of iron contg. cerium at high temp.)
RN 1306-38-3 HCA
CN Cerium oxide (CeO₂) (CA INDEX NAME)

O==Ce==O

CC 55 (Ferrous Metals and Alloys)
IT 1306-38-3P 12218-12-1P
(formation of, in oxidn. of iron contg. cerium at high temp.)

L44 ANSWER 21 OF 23 HCA COPYRIGHT 2007 ACS on STN

AN 66:51523 HCA Full-text

TI Spherical particles for use in nuclear fuel elements and a process for producing them

PA Minnesota Mining and Manufacturing Co.

SO Brit., 9 pp.

CODEN: BRXXAA

DT Patent

LA English

FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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PI GB 1054783 19670111 GB <--
DE 1467344 DE

PRAI US 19620625 <--

AB A method is described to produce spherical particles for nuclear fuel elements. For example, a mixt. contg. 750 parts uranyl nitrate hexahydrate and 35.8 parts finely divided Thermax Brand C is heated to 90°. A high shear bar turbine impeller is rotated in the melt for 15 min. at 14,500 rpm. A hollow cone spray nozzle at 90° and with a spray pressure of 37 psi. produces a range of particles 50-250 µ in diam. The nozzle is placed about 1 in. from the upper surface of the liquid in the vessel 6 in. in diam. and 3 ft. long contg. fluorocarbon FC-75 at 10°. The fluorocarbon liquid is circulated

from the vessel through a cooler and back to the vessel. The molten spray forms spherical particles of uranyl nitrate hexahydrate contg. C. The particles settle to the bottom of the vessel where they are removed through a valve located at the lowest point. An amt. of liquid remains with the spherical particles and the slurry thus obtained is spread on trays. The solvent is permitted to evap. Then the dried particles are screened through sieves of mesh size 60 to mesh size 270 in a shaking device. Particles retained on the mesh size 60 or which pass the mesh size 270 are recycled. The other dried spherical particles are placed in a flask at 15-30 torr, rotated at 100 rpm. while the temp. is slowly raised to 300° in 9 hrs . The temp. is kept 1st at 40° for a sufficient time to eliminate 3 mols. H₂O of hydration, then at 80° to remove the last H₂O mol. of hydration. Then the temp. is raised to 250-300° to accomplish denitration. The particles are then cooled to room temp. They are perfectly spherical and consist of a mixt. of UO₃ and C 50-250 μ in diam.

IT 1306-38-3P

(solid solns. with uranium oxide (UO₂), manuf. of
spherical nuclear reactor fuel particles of)

RN 1306-38-3 HCA

CN Cerium oxide (CeO₂) (CA INDEX NAME)

O==Ce==O

IC C01G

CC 76 (Nuclear Technology)

IT 409-21-2P, preparation 1305-78-8P, preparation 1306-38-3P
1313-96-8P 1314-23-4P, preparation 13463-67-7P, preparation
(solid solns. with uranium oxide (UO₂), manuf. of
spherical nuclear reactor fuel particles of)

L44 ANSWER 22 OF 23 HCA COPYRIGHT 2007 ACS on STN

AN 64:102165 HCA Full-text

OREF 64:19148e-h,19149a-c

TI Influence of the gaseous medium on chemical reactions and
polymorphic transformations in the system zirconium dioxide-cerium
oxides

AU Leonov, A. I.; Keler, E. K.; Andreeva, A. B.

CS I. V. Grebenshchikov Inst. Chem. Silicate, Leningrad, USSR

SO Ogneupory (1966), 31(3), 42-8

CODEN: OGNPA2; ISSN: 0369-7290

DT Journal

LA Russian

AB The phase diagram of the system ZrO₂-CeO₂ (in an oxidizing atm.), known from previous studies, is entirely different from that of the system ZrO₂-Ce₂O₃ (in an atm. with a very low partial pressure of O₂, including vacuum) is studied. In this system, the monoclinic (< 1000°) and the tetragonal (>1000. degree.) ZrO₂ dissolves approx. 3 mole % Ce₂O₃. At concns. from 3 to 27 mole % Ce₂O₃ there are several 2-phase regions contg. a solid soln. of monoclinic or tetragonal ZrO₂, and a solid soln. on the basis of the chem. compd. Ce₂Zr₂₀₇. High-temp. phases are composed of a pseudo-cubic solid solns. of ZrO₂ in the interval 5-17 mole % Ce₂O₃ continuously transgressing into a cubic structure, stable above 1700°. On the ZrO₂ side, there is a 2-phase region contg. the cubic and the tetragonal solid soln. of ZrO₂; on the Ce₂O₃ side there are solid solns. of Ce₂Zr₂₀₇ and cubic sold solns. of ZrO₂. The phase contg. 33.33 mole % Ce₂O₃ is the cubic compd. Ce₂Zr₂₀₇, with $a = 10.70 \text{ \AA}$. It forms a solid soln. in the interval 26-40 mole % Ce₂O₃ at 1650°. At higher Ce₂O₃ concn. from 40 to 65 mole % Ce₂O₃ at 1650°, a 2-phase region appears: solid soln. of Ce₂Zr₂₀₇ and of ZrO₂, narrowing with increasing temps. From 65 to 77 mole % Ce₂O₃ there appears a metastable cubic solid soln. of ZrO₂ and a solid soln. on the basis of the hexagonal structure of Ce₂O₃. Parameters of this structure are $a = 3.89$ and $c = 6.05 \text{ \AA}$. The calcd. d. is 6.87, color yellow-green, m.p. $2160 \pm 30^\circ$. Dilatometric measurements in H established that in the interval 0-27 mole % Ce₂O₃ the polymorphic ZrO₂ transformation monoclinic-tetragonal takes place, with a hysteresis in the interval 900-1200 °. With increasing concn. of Ce₂O₃ the dimension changes decrease and at 27-30 mole % Ce₂O₃ disappear. CeO₂ is the most effective stabilizer of ZrO₂, probably due to the Ce⁴⁺ radius. Related literature data show strong deviations from each other. X-ray diagrams are given of the 50 mole % CeO₂ stabilized (in O-contg. atm.) ZrO₂ before and after its treatment at 1400. degree. in H, or at a partial pressure of O < 1.4 + 10-5 atm., resulting in the formation of Ce₂Zr₂₀₇. Curves of the thermographic analysis in air of Ce₂O₃-stabilized ZrO₂ as a function of the Ce₂O₃ content in the range 20-60 mole % Ce₂O₃ show a double max. exothermic effect in the region 250° (at 20 mole %), and 150° (at 60 mole % Ce₂O₃), strongly increasing with the Ce₂O₃ concn. Above 1000°, no appreciable thermal effects are observed. The effect is caused by the oxidation of Ce(III) into Ce(IV). Small effects are caused by the polymorphic transformations (with 20 mole % Ce₂O₃ an endothermic effect at 1130°, on heating, an exothermic effect at 1040°, on cooling). Sample with 33.33 mole % Ce₂O₃ shows upon heating an endothermic effect at 10560° and an exothermic effect at 1150°, in conformity with the x-ray analysis. Oxidation of Ce(III) in air is appreciable at 200° causing a change in the lattice parameters, but without a change of the structure of the solid soln. At temps. 100- 800°, the CeO₂ produced

forms with ZrO₂ a metastable phase which decomp. at 1200°, resulting in the formation of tetragonal and cubic equil. solid soln. of the system ZrO₂-CeO₂. In the absence of a full stabilization of ZrO₂, e.g. with <40 mole % CeO₂, produced by the low-temp. oxidn. of CeO₂, strong dimensional changes as a function of temp. occur. Redn.-oxidn. cycling of samples at 1200° shows an increase of dimensions at redn., and a decrease on oxidn. In an inert gas atm., no change occurs. After oxidn.-redn. cycling, samples became porous and full of cracks. 21 references.

IT 1345-13-7, Cerium oxide, CeO₂
(reaction with ZrO₂, O effect on)
RN 1345-13-7 HCA
CN Cerium oxide (CeO₂) (CA INDEX NAME)
*** STRUCTURE DIAGRAM IS NOT AVAILABLE ***
IT 1306-38-3, Cerium oxide, CeO₂
(reactions with ZrO₂, O effect on)
RN 1306-38-3 HCA
CN Cerium oxide (CeO₂) (CA INDEX NAME)



CC 21 (Ceramics)
IT 1345-13-7, Cerium oxide, CeO₂
(reaction with ZrO₂, O effect on)
IT 1306-38-3, Cerium oxide, CeO₂
(reactions with ZrO₂, O effect on)

L44 ANSWER 23 OF 23 HCA COPYRIGHT 2007 ACS on STN
AN 64:25426 HCA Full-text
OREF 64:4649a-e
TI Pilot plant processing of monazite sands to rare earth salts in Czechoslovakia
AU Holub, Ludek
CS Spolana, Neratovice, Czech.
SO Chemicky Prumysl (1965), 15(10), 577-81
CODEN: CHPUA4; ISSN: 0009-2789
DT Journal
LA Czech
AB Rare earth (RE) chem. and a discussion of existing methods for industrial processing of monazite sands are briefly reviewed. In the pilot plant monazite sand is sep'd. electromagnetically and the middle magnetic fraction contg. monazite is ground in a ball mill so that 74, 25, and 1 percent passes through the sieves of 0.075, 0.1, and 0.12 mm., resp. A charge of monazite (15 kg.) was mixed with a 47%

NaOH soln. contg. 22.5 kg. NaOH. The decompr. was carried out at 125-130° for 3 h. The decomprd. mixt. was poured into 360 l. H₂O at 80° and mixed at this temp. for 15 min. After the settling of the ppt., the strongly alk. soln. was filtered and then decanted twice with 110 l. H₂O at 80°. The 1st filtrate was concd. to 96 l., and after cooling, 15.2 kg. Na₃PO₄.12H₂O and 53 l. 20% NaOH soln. (13.5 kg. NaOH) were obtained. The ppt. of RE and Th hydroxides was suspended in a small vol. of mother liquor and washed with 110 l. H₂O at 80°. The ppt. (17.2 kg.) was dissolved in 14 l. concd. HCl. The temp. increased spontaneously to 70° and then was maintained at 80° for 40 min. until the ppt. dissolved. After dilg. to 63 l. with H₂O and neutralization to pH 3 with a 25% aq. NH₃, Th(OH)₄ was ptd. at 80°. Neutralization was continued to pH 4.2 until the IO₃⁻ test for Th⁴⁺ was neg. The raw Th(OH)₄ was filtered and twice decanted at 80° with 53 and 30 l. H₂O contg. 100 g. NH₄Cl. The Th(OH)₄ was then dissolved in 2 l. of concd. HCl at 80° and 4 l. of H₂O added; the soln. was neutralized with 1.2 l. 25% aq. NH₃ to pH 3. The undecomprd. monazite was filtered and to the filtrate 0.28 kg. of oxalic acid was added. Raw Th oxalate (0.36 kg.) was filtered after 24 h. The RE chlorides soln. (112 l.) was concd. to 28 l. at 120-135° and 10 kg. of Ce chlorides, readily sol. in H₂O, was obtained. These were used directly for the electrolytic prodn. of ferrocerium. The electrolytic waste was either processed to mixed RE oxides suitable as grinding and polishing material for optical glass or used for CeO₂ prodn. The method described was used for Chinese and Korean monazite sands imported to Czech.

IT 1306-38-3P, Cerium oxide, CeO₂
(recovery of, from monazite sands)

RN 1306-38-3 HCA

CN Cerium oxide (CeO₂) (CA INDEX NAME)



CC 17 (Industrial Inorganic Chemicals)

IT 1306-38-3P, Cerium oxide, CeO₂ 7790-86-5P, Cerium chloride
(recovery of, from monazite sands)

=> D HIS L46-

FILE 'HCA'

L46 352312 S (2 OR 5 OR 10 OR 15 OR 20 OR 25 OR 30 OR 35 OR 40 OR 45
L47 435 S (L4 OR L14 OR L15) AND L46

L48 1 S L47 AND L5
L49 5 S L47 AND L6
L50 28 S L47 AND L7
L51 7 S L47 AND L26
L52 297 S L47 AND L27
L53 21 S L50 AND L52
L54 23 S (L48 OR L49 OR L50 OR L51 OR L53) NOT (L42 OR L43 OR L4
L55 7 S 1840-2002/PY,PRY AND L54
L56 16 S L54 NOT L55

=> D L55 1-7 BIB ABS HITSTR HITIND

L55 ANSWER 1 OF 7 HCA COPYRIGHT 2007 ACS on STN
AN 140:66547 HCA Full-text
TI Phases formation rate at synthesis of actinide waste forms
AU Laverov, N. P.; Yudintsev, S. V.; Lapina, M. I.; Stefanovsky, S. V.;
Chae, S. C.; Ewing, R. C.
CS IGEM RAS, Moscow, 119017, Russia
SO Materials Research Society Symposium Proceedings (2002),
Volume Date 2003, 757(Scientific Basis for Nuclear Waste Management
XXVI), 321-328
CODEN: MRSRDPH; ISSN: 0272-9172
PB Materials Research Society
DT Journal
LA English
AB Rate of zirconolite ($\text{CaZrTi}_2\text{O}_7$) and pyrochlores ($\text{Gd}_2\text{Ti}_2\text{O}_7$, $\text{CaCeTi}_2\text{O}_7$, and $\text{Gd}_2\text{Zr}_2\text{O}_7$) formation by cold pressing and sintering (CPS) was studied. Batches were prep'd. from CaCO_3 , ZrO_2 , TiO_2 , CeO_2 , and Gd_2O_3 milled to size of 20-30 μm . Powders were compacted and sintered in air (O₂) at 800-1600°. degree. for 0.5-55 h. Samples were examt. with XRD, SEM, and TEM. Phase formation rate was the fastest in Gd-Ti-O and Ca-Ce-Ti-O systems and the reactions were the slowest in Gd-Zr-O system. In zirconolite-based system reaction rate had intermediate value. For 3 systems at 1400° equil. was reached in 3-5 h, while in Gd-Zr-O system required apprx.10 time longer reaction time. High formation rate was evidently one of the reasons to select the pyrochlore ($\text{Ca}, \text{Gd}, \text{U}, \text{Pu})_2(\text{Hf}, \text{Ti})_2\text{O}_7$ as a host for Pu in the USA. The authors have also studied an effect of Ti on pyrochlore formation in the Gd-Zr-Ti-O system. The batches with nominal compn. $\text{Gd}_2\text{Ti}_0.4\text{Zr}_1.6\text{O}_7$, $\text{Gd}_2\text{Ti}_0.2\text{Zr}_1.8\text{O}_7$, and $\text{Gd}_2\text{Ti}_0.1\text{Zr}_1.9\text{O}_7$ were compacted and annealed at 1500-1600° for 3-98 h. In most of them along with pyrochlore unreacted Zr and Gd oxides were found. Their content reduced with temp. and sintering duration increasing. Pyrochlore compn. was varied in different parts of the samples. Variation range decreased with rise of temp., runs duration, and Ti content in the

precursors. Partial substitution of Ti for Zr increased rate of pyrochlore formation. However, even at the highest Ti content (0.4 formula units) and temp. of synthesis (1600°) too long sintering duration in tens of hours is required to form a single-phase pyrochlore matrix. This makes their prodn. from oxide precursor via CPS route inefficient. Inductive melting in a cold crucible or self-sustaining high-temp. synthesis are more promising methods for fabrication of the zirconate pyrochlores.

IT 1306-38-3, Cerium oxide (CeO₂), reactions
(phases formation rate at synthesis of
actinide waste forms)

RN 1306-38-3 HCA

CN Cerium oxide (CeO₂) (CA INDEX NAME)



CC 71-11 (Nuclear Technology)

Section cross-reference(s): 57

IT 471-34-1, Calcium carbonate (CaCO₃), reactions 1306-38-3,
Cerium oxide (CeO₂), reactions 1314-23-4, Zirconium
oxide (ZrO₂), reactions 12064-62-9, Gadolinium oxide (Gd₂O₃)
13463-67-7, Titanium oxide (TiO₂), reactions
(phases formation rate at synthesis of
actinide waste forms)

RE.CNT 18 THERE ARE 18 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L55 ANSWER 2 OF 7 HCA COPYRIGHT 2007 ACS on STN

AN 138:94509 HCA Full-text

TI Catalyst for treating automotive exhaust gases and its preparation

IN Shen, Dixin; Chen, Hongda; Tian, Qun; He, Zhanyuan

PA Ecological Environment Research Center, Chinese Academy of Sciences,
Peop. Rep. China

SO Faming Zhanli Shengqing Gongkai Shuomingshu, 14 pp.

CODEN: CNXXEV

DT Patent

LA Chinese

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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PI	CN 1342520	A	20020403	CN 2000-124737	200009
					14

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PRAI CN 2000-124737

20000914 <--

AB The title catalyst is prep'd. by impregnating an iolite honeycomb ceramic with Al2O3 slurry contg. La2O3, CeO₂, noble metal, transition metal and alk. earth metal, drying, calcining at 400-600. degree. for 2-6 h, reducing at 400-600. degree. for 2-6 h, and coating. The slurry contains La 1-4, Ce 3-12, Pt 0.1-0.25, Pd 0.1-0.25, Rh 0.05-0.3, Mg, Ba and/or Sr 2-7%. The catalyst is highly durable and active for treating exhaust gases contg. NO_x, CO and hydrocarbons at various temp. range.

IT 1306-38-3, Cerium dioxide, uses

(catalyst for treating automotive exhaust gases and its
prep'n.)

RN 1306-38-3 HCA

CN Cerium oxide (CeO₂) (CA INDEX NAME)

O==Ce==O

IC ICM B01J023-62

ICS B01J037-02; B01D053-94

CC 59-3 (Air Pollution and Industrial Hygiene)

Section cross-reference(s): 67

IT 1306-38-3, Cerium dioxide, uses 1312-81-8, Lanthanum trioxide

(catalyst for treating automotive exhaust gases and its
prep'n.)

L55 ANSWER 3 OF 7 HCA COPYRIGHT 2007 ACS on STN

AN 137:156822 HCA Full-text

TI Production of cerium (IV) ammonium nitrate.

IN Tanaka, Shinya; Ishikawa, Junichi

PA Sumitomo Chemical Co., Ltd., Japan

SO Jpn. Kokai Tokkyo Koho, 8 pp.

CODEN: JKXXAF

DT Patent

LA Japanese

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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PI JP 2002220229 A 20020809 JP 2001-10025

200101
18

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PRAI JP 2001-10025

20010118 <--

AB The process comprises adding seed crystals into a cerium (IV) ammonium nitrate aq. soln. at a temp. of T1 to (T1-10°) (e.g., 80-100°), where T1 is the satn. temp. of cerium (IV) ammonium nitrate, then cooling the aq. soln. to ≤ 30° at av. cooling speed of 25°/h for pptg. cerium (IV) ammonium nitrate crystals. The cerium (IV) ammonium nitrate aq. soln. can be obtained by dissolving, e.g., cerium (IV) oxide hydrate or cerium (IV) hydroxide in a nitric acid aq. soln., and then mixing with ammonium nitrate; ammonium nitrate aq. soln. can be used as the above stated ammonium nitrate. In the above stated process, after adding the seed crystals, the aq. soln. can be kept in a temp. range of (50-90°)±5° for ≥ 30 min, and then cooling to ≤ 30°.

IC ICM C01F017-00

CC 49-5 (Industrial Inorganic Chemicals)

IT 6484-52-2, Ammonium nitrate, reactions 12014-56-1, Cerium (IV) hydroxide 23322-64-7, Cerium oxide (CeO₂), hydrate
(prodn. of cerium (IV) ammonium nitrate)

L55 ANSWER 4 OF 7 HCA COPYRIGHT 2007 ACS on STN

AN 137:50915 HCA Full-text

TI Manufacture of high-strength polycrystalline Sitall-type glass ceramic

IN Khalilev, V. D.; Androkhyanov, A. A.; Merkulov, Yu. Yu.; Koroleva, M. V.

PA Russia

SO Russ., No pp. given

CODEN: RUXXE7

DT Patent

LA Russian

FAN.CNT 1

PATENT NO.

KIND

DATE

APPLICATION NO.

DATE

PI RU 2169712

C1

20010627

RU 2000-126801

200010
26

WO 2002034685

A1

20020502

WO 2001-RU423

200110
17

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W: AL, AM, AT, AU, AZ, BB, BG, BR, BY, CA, CH, CN, CZ, DE, DK,
EE, ES, FI, GB, GE, HU, IL, IS, JP, KE, KG, KP, KR, KZ, LK,
LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT,
RO, RU, SD, SE, SG, SI, SK, TJ, TM, TR, TT, UA, UG, US, UZ,

VN, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM
RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW, AT, BE, CH,
CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE,
TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN,
TD, TG

AU 2002012874

A5 20020506

AU 2002-12874

200110
17

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PRAI RU 2000-126801 A 20001026 <--
WO 2001-RU423 W 20011017 <--

AB The Sitall glass ceramic contains SiO₂ 57-70, Li₂O 12.7-19, NaPO₃ 2-4, K₂O 1.7-2.5, CaF₂ 0.9-1.2, LiF 4-8, CeO₂ 0.1-1, TiO₂ 0.1-9, CaO 0.1-4, MnO/MnO₂ = 0.1-4, Al₂O₃ 0.1-4 wt.%. The high-strength Sitall is manufd. from lithium-silicate glass by melting at 1300-1350°, forming of specimens by pouring into a cold mold, annealing at 400-420°, and two-stage thermal treating after annealing by rising temp. to 480-520°, holding for 2-3 h, rising temp. to 680-720° with the rate of 1-4 degrees per min, holding for 1-2 h followed by cooling in air to the room temp. Obtained low-melting polycryst. glass exhibits high strength in combination with low d. and can be used under conditions of extreme loadings.

IT 1306-38-3, Cerium oxide (CeO₂), uses
(Sitall component; manuf. of high-strength polycryst.
Sitall-type glass ceramic)

RN 1306-38-3 HCA

CN Cerium oxide (CeO₂) (CA INDEX NAME)



IC ICM C03C010-12

CC 57-1 (Ceramics)

IT 1305-78-8, Calcium oxide (CaO), uses 1306-38-3, Cerium oxide (CeO₂), uses 1313-13-9, Manganese oxide (MnO₂), uses 1344-28-1, Alumina, uses 1344-43-0, Manganous oxide, uses 7789-75-5, Calcium fluoride (CaF₂), uses 10361-03-2, Sodium phosphate (NaPO₃) 12136-45-7, Potassium oxide (K₂O), uses 13463-67-7, Titanium dioxide, uses
(Sitall component; manuf. of high-strength polycryst.
Sitall-type glass ceramic)

L55 ANSWER 5 OF 7 HCA COPYRIGHT 2007 ACS on STN

AN 132:328987 HCA Full-text

TI Preparation of ultrafine CeO₂ particles by using

different methods. II. Frozen dehydration method and urea decomposition method

AU Hou, Wen-Hua; Xu, Lin; Chen, Li-gang; Yan, Qi-jie; Chen, Jing
CS Department of Chemistry, Nanjing University, Nanjing, 210093, Peop.
Rep. China
SO Nanjing Daxue Xuebao, Ziran Kexue (2000), 36(1), 100-103
CODEN: NCHPAZ; ISSN: 0469-5097
PB Nanjing Daxue
DT Journal
LA Chinese
AB This paper reports the prepn. of ultrafine CeO₂ particles by using frozen dehydrating method and urea decompn. method. The results are compared with that of sol-gel method. It is found that reaction temp.(Tr), ammonia concn.(Ca) and calcination temp.(Tc) significantly affect the particle size and the surface area of the product for frozen dehydrating method. TEM results show that gelatinized at 0°C, CeO₂ particles with an av. particle size of 7 nm and a surface area of 89 m²/g are obtained, while raising the gelatinization temp. to 25°C, the av. size increases to 16 nm and surface area decreases to 73 m²/g, resp. It can be explained that at higher temp., the particles with high surface energy collide more frequently and are easy to aggregate hence the av. particle size increases and surface area decreases. The ammonia concn. also affects the particle size of CeO₂. Too high an ammonia concn. will give larger particles. CeO₂ particles prepd. by frozen dehydrating method have high surface activity and therefore are easy to aggregate while calcining at 400. degree.C would lead to sintering. CeO₂ prepd. by urea decompn. method calcined at 400. degree.C for 2 h is brick-shaped and porous with an av. particle diam. beyond 500 nm, a high surface area of 127 m²/g and an av. pore diam. of 2.1 nm. XRD result shows that the product compn. as prepd. is Ce₂O(CO₃)₂·H₂O; IR spectrum confirms the existence of CO₂-3. DTA anal. suggests that Ce₂O(CO₃)₂·H₂O first dehydrates to form Ce₂O(CO₃)₂ and then decompns. at 277°C to form CeO₂. Comparing sol-gel, frozen dehydrating and urea decompn. method, we can conclude that using sol-gel method an av. diam. around 10 nm ultrafine CeO₂ can be obtained at mild condition. The disadvantage of this method is that org. materials and NO₃- are not easy to remove. The CeO₂ particles prepd. by frozen dehydrating method at low temp. are fine and homogeneous and contain no org. materials, but it is easy to sinter. Using urea decompn. method we can prep. porous CeO₂ with high surface area, but the particle size is over 500 nm.
IT 1306-38-3P, Ceria, preparation
(prepn. of ultrafine CeO₂ particles by using
frozen dehydration and urea decompn. method)
RN 1306-38-3 HCA
CN Cerium oxide (CeO₂) (CA INDEX NAME)

O==Ce==O

CC 78-2 (Inorganic Chemicals and Reactions)
Section cross-reference(s): 57

IT Adsorption
Decomposition
Dehydration
Particle size
Precipitation (chemical)
Surface activity
Surface area
(prepn. of ultrafine CeO₂ particles by using
frozen dehydration and urea decompn. method)

IT Organic compounds, processes
(prepn. of ultrafine CeO₂ particles by using
frozen dehydration and urea decompn. method)

IT Particles
(ultrafine; prepn. of ultrafine CeO₂
particles by using frozen dehydration and urea decompn. method)

IT 1306-38-3P, Ceria, preparation 96390-65-7P,
Cerium carbonate oxide (Ce₂(CO₃)₂)
(prepn. of ultrafine CeO₂ particles by using
frozen dehydration and urea decompn. method)

IT 57-13-6, Urea, reactions 7664-41-7, Ammonia, reactions
(prepn. of ultrafine CeO₂ particles by using
frozen dehydration and urea decompn. method)

IT 14797-55-8, Nitrate, processes
(prepn. of ultrafine CeO₂ particles by using
frozen dehydration and urea decompn. method)

L55 ANSWER 6 OF 7 HCA COPYRIGHT 2007 ACS on STN
AN 116:219883 HCA Full-text
TI Synthesis of some phases in the metal-silicon-aluminum-oxygen-nitrogen system
AU Teoreanu, Ion; Andronescu, Ecaterina; Dumitrescu, Lucia
CS Inst. Politeh. Bucuresti, Bucharest, Rom.
SO Materiale de Constructii (Bucharest, Romania) (1991),
21(1), 33-5
CODEN: MCTIBU; ISSN: 0253-0201
DT Journal
LA Romanian
AB X-ray diffraction was used to study the effect of temp. (1400-1480. degree.), time (2-5 h), and oxide additives (Y₂O₃, CeO₂, Nd₂O₃, and Nb₂O₅) on the phase distribution in the Si₃N₄-AlN-Al₂O₃-SiO₂ system

to optimize Si₃N₄ synthesis. The yield of the Si₃N₄ phase increased with increasing temp., time, and addn. of 1% oxides. The CeO₂ additive exerted the most significant pos. effect.

IT 1306-38-3, Ceria, properties

(phase formation in alumina-aluminum

nitride-silica-silicon nitride system in relation to)

RN 1306-38-3 HCA

CN Cerium oxide (CeO₂) (CA INDEX NAME)



CC 57-2 (Ceramics)

IT 1306-38-3, Ceria, properties 1313-96-8, Niobium oxide

1313-97-9, Neodymia 1314-36-9, Yttria, properties

(phase formation in alumina-aluminum

nitride-silica-silicon nitride system in relation to)

L55 ANSWER 7 OF 7 HCA COPYRIGHT 2007 ACS on STN

AN 96:23880 HCA Full-text

TI Polishing compositions

IN Khaladji, Jean; Peltier, Marcel

PA Rhone-Poulenc Industries S. A., Fr.

SO Eur. Pat. Appl., 17 pp.

CODEN: EPXXDW

DT Patent

LA French

FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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PI EP 31749	A2	19810708	EP 1980-401773	198012 10
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EP 31749	A3	19810722
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EP 31749	B1	19830413
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R: AT, BE, CH, DE, FR, GB, IT, NL, SE

FR 2472601	A1	19810703	FR 1979-31742
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197912
27

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FR 2472601	B1	19831202
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AT 3054	T	19830415
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AT 1980-401773

198012

10

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BR 8008474 A 19810714 BR 1980-8474

198012
23

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AU 8065835 A 19810702 AU 1980-65835

198012
24

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AU 546390 B2 19850829

JP 56131686 A 19811015

JP 1980-184144

198012
26

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JP 57058388 B 19821209

PRAI FR 1979-31742 A 19791227 <--

EP 1980-401773 A 19801210 <--

AB An abrasive material for polishing glass is obtained by reacting a Ce salt at pH >6.0, filtering the ppt., drying, and calcining at 600-1200° for 0.5-10

h. Thus, solns. of Ce(NO₃)₃ 1 mol/L, 2N NH₃, (NH₄)₂SO₄ 0.05, and NH₄F 0.05 mol/L are fed into a reactor to maintain the pH at 8.9 ± 0.1 (with a holding time of 1 h) and the temp. is raised from 25 to 75°. The ppt. is filtered, washed, dried, and calcined for 3 h at 850.degree ., and then ground to a particle size of <15 μ (>99.9%) to give an abrasive with a polishing efficiency of 27 mg/dm²/mn.

IC C09K003-14; C01F017-00

CC 57-7 (Ceramics)

IT Glass, oxide

(polishing of, cerium oxide abrasive for,
prep'n. and efficiency of)